Performance and Visibility

Allen-Bradley

FactoryTalk® View Machine Edition User's Guide

User's Guide

Allen-Bradley • Rockwell Software

Rockwell Automation

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About the documentation

The FactoryTalk View Machine Edition documentation set includes:

- *Release Notes:* Information to read before you begin installing or working with the software.

  The Release Notes are available on the FactoryTalk View installation DVD, as well as from the Help menu in FactoryTalk View Studio.

- *FactoryTalk View Machine Edition Installation Guide:* A guide to installing and activating the various components of FactoryTalk View Machine Edition.

  The Installation Guide is available on the FactoryTalk View installation DVD, as well as from the Help menu in FactoryTalk View Studio.

- *FactoryTalk View Machine Edition User's Guide:* Comprehensive information about FactoryTalk View Machine Edition, procedures for creating and running an automation application, and reference information.

  The User's Guide is also available on the FactoryTalk View installation DVD, as well as from the Help menu in FactoryTalk View Studio.

- *Help:* Online procedures and reference information.

  Help is available from the **Help** menu in FactoryTalk View Studio.

Find the information you need

You have many options for finding information about how to use FactoryTalk View, or how to solve problems with FactoryTalk View.

Try the User's Guide and Help first

The User's Guide and Help provide comprehensive information about typical uses of FactoryTalk View. Chances are, your question is answered in the documentation.

To find the answer, use the table of contents and the index in the User's Guide and Help.

You can also perform a full-text search on both the Help and the User's Guide. For information about using Help, see Getting the information you need in the *FactoryTalk View Machine Edition Installation Guide*.

For information about performing searches on the User's Guide, see Adobe Reader Help.

Find information on the Internet

If you cannot find the answer to your question or problem in the User's Guide or Help, you can find information on the Internet.

You can connect to the Rockwell Automation web site from within FactoryTalk View Studio. To do so, you must have a web browser installed on your computer, and you must have an active Internet connection.

To connect to web sites from FactoryTalk View Studio

- From the **Help** menu, select **Rockwell Automation on the Web**, and then select the name of the web page you want to view.

The Rockwell Automation Knowledgebase

The Knowledgebase web page leads to a comprehensive, searchable database of support information for all Rockwell Automation products.

Contact Rockwell Automation Technical Support

If you cannot find the answer to your question in the documentation or on the Internet, contact Rockwell Automation Technical Support, using any of these methods:

- Telephone: 1-440-646-3434
- Online: http://www.rockwellautomation.com/support

Support staff are available Monday to Friday from 8:00 a.m. through 5:00 p.m. local time (North America only), except on statutory holidays.

When you call Rockwell Automation Technical Support

When you call, it is recommended that you be at your computer and ready to provide the following information:

- The product's serial number and product key, which are printed on the Activation Certificate enclosed with the product software DVD
- The FactoryTalk View product version number
- FactoryTalk Services Platform version number
- The Connectivity product(s) (RSLinx Enterprise or RSLinx Classic) version number(s)
- The type of hardware you are using
- The names of other Rockwell Automation products installed on the computer

- The exact wording of any messages shown on the computer
- A description of what happened and what you were doing when the problem occurred
- A description of how you tried to solve the problem

To view the list of installed add-ons and updates

1. In FactoryTalk View Studio, select **Help**> **About FactoryTalk View Studio**.
2. To view the list of installed add-ons, click **Add-Ons**.

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Contact Rockwell

Customer Support Telephone — 1.440.646.3434
Online Support — http://www.rockwellautomation.com/support/
http://www.rockwellautomation.com/support/

Get Started

FactoryTalk View Machine Edition is software for developing and running human-machine interface applications. FactoryTalk View Machine Edition is designed for monitoring and controlling automated processes and machines.

For information about installing FactoryTalk View Machine Edition, see the *FactoryTalk View Machine Edition Installation Guide*.

Review operating system requirements

FactoryTalk View ME software is supported on these Microsoft Windows operating systems:

Operating System	32-bit	64-bit
Windows Server 2012 R2 Datacenter Edition		X
Windows Server 2012 R2 Standard Edition		X
Windows Server 2012 Datacenter Edition		X
Windows Server 2012 Standard Edition		X
Windows 8.1 Enterprise Edition	X	X
Windows 8.1 Professional	X	X
Windows 8 Professional	X	X
Windows 8 Enterprise Edition	X	X
Windows 7 Ultimate with Service Pack 1		X
Windows 7 Enterprise Edition with Service Pack 1	X	X
Windows 7 Professional with Service Pack 1	X	X
Windows 7 Professional	X	X
Windows Server 2008 R2 Standard Edition		X
Windows Server 2008 R2 Enterprise Edition with Service Pack 1		X
Windows Server 2008 R2 Standard Edition with Service Pack 1		X
Windows Server 2008 Standard Edition with Service Pack 2	X	X
Windows XP Professional with Service Pack 3	X	

For the latest information regarding software platform support, refer to http://www.rockwellautomation.com/compatibility/#/scenarios.

- PanelView Plus and PanelView Plus CE terminals running Microsoft Windows CE 4.1
- PanelView Plus 6 terminals running Microsoft Windows CE 6.0

- PanelView Plus 7 terminals running Microsoft Windows CE 6.0

  Tip: FactoryTalk View Studio is tested and supported on operating systems installed from original Microsoft media only. For operating systems installed by the computer vendor, please see Knowledgebase article 26842.

FactoryTalk View Machine Edition gives you all the tools you need to create effective machine-level monitoring and control applications.

The parts of FactoryTalk View Machine Edition

FactoryTalk View Machine Edition includes the following products:

- **FactoryTalk View Studio** is configuration software for developing machine-level applications. This software runs on operating systems such as Microsoft Windows Server 2012, Windows 8.1, Windows 8, Windows 7, Windows Server 2008, and Windows XP operating systems.
- **FactoryTalk View ME Station** is a stand-alone runtime environment for machine-level applications. Use FactoryTalk View ME Station to run the applications you develop in FactoryTalk View Studio.
- **RSLinx Enterprise** is a communication server built around FactoryTalk technology to assist in developing and running your FactoryTalk View ME applications.

You can run machine-level applications on the Windows CE 6.0 PanelView Plus 7, Windows CE 6.0 PanelView Plus 6, Windows CE 4.1 PanelView Plus, and PanelView Plus CE terminals, aswell as on personal computers.

Additional software

The FactoryTalk View installation DVD also includes two additional software products:

- **RSLinx Classic** is software that provides communications to a wide range of communication drivers. RSLinx Classic is an OPC-compliant data server. RSLinx Classic is available for personal computers only.
- **Adobe Reader 11.0.08** is software for reading the online *FactoryTalk View Machine Edition User's Guide*. If desired, you can also use the software to print the User's Guide.

The FactoryTalk View Machine Edition tools

FactoryTalk View Studio tools

These tools are installed with FactoryTalk View Studio:

- **Application Documenter** is software that provides detailed information about FactoryTalk applications.

- **Application Manager** is software for renaming, copying, deleting, backing up, and restoring applications.
- **DeskLock** is the software that prevents Microsoft Windows Server 2012, Windows 8.1, Windows 8, Windows 7, Windows Server 2008, and Windows XP operating systems users from exiting the FactoryTalk View application at run time. You can use this tool to set up a customized desktop and to prevent access to Windows functions. You cannot use DeskLock if you are running your application on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal.
- **FactoryTalk View File Viewer** is software for viewing the following types of log files:
  - SE datalog files
  - ME datalog files
  - ME alarm log files
  - dBase files
  - ME RecipePlus files

  The log information can be shown in the form of list views or trend plots. You can save the files as CSV or dBase files so that it is easier to do more analysis.
- **FTVIEWUSER Account Reset** is software for resetting the FTVIEWUSER account back to its default.
- **Legacy Tag Database Conversion** is software for converting your legacy tag database to a new format to work with Microsoft SQL database.
- **ME Firmware Upgrade Wizard** is software for installing new firmware releases on PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, and PanelView Plus CE terminals.
- **ME Transfer Utility** is software for moving a runtime machine-level application (.mer file) from the development computer to a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal.
- **Tag Import and Export Wizard** is software for importing or exporting the FactoryTalk View tag database.

To start FactoryTalk View Studio tools

- From the Windows Start menu, select **Programs** > **Rockwell Software** > **FactoryTalk View** > **Tools**, and then select the tool.

  You can also select tool from the **Tools** menu in FactoryTalk View Studio.

Diagnostics Viewer

Diagnostics Viewer allows you to view FactoryTalk Diagnostics messages using the FactoryTalk Diagnostics Viewer.

To start Diagnostics Viewer

- From the Windows Start menu, select **Programs > Rockwell Software > FactoryTalk Tools > Diagnostics Viewer.**

  You can also select the tool from the **Tools** menu in FactoryTalk View Studio.

FactoryTalk tools

FactoryTalk tools are installed when you install FactoryTalk Services Platform.

To start FactoryTalk tools

- From the Windows Start menu, select **Programs > Rockwell Software > FactoryTalk Tools**, and then select the tool to start.

FactoryTalk Activation Manager

FactoryTalk Activation Manager is automatically installed when you install FactoryTalk View.

To start FactoryTalk Activation Manager

- From the **Windows Start** menu, select **Programs > Rockwell Software > FactoryTalk Activation > FactoryTalk Activation Manager**.

Explore FactoryTalk View Studio

This chapter describes:

- Start and exit FactoryTalk View Studio
- Open sample applications
- Explore the FactoryTalk View Studio main window
- Use the Explorer window
- Work with editors
- Enter information in spreadsheets
- Print information in editors

For information about working with editors' components, see Work with components on page 294.

Start and exit FactoryTalk View Studio

FactoryTalk View Studio is configuration software for developing machine-level applications. This software runs on Microsoft Windows Server 2012, Windows 8.1, Windows 8, Windows 7, Windows Server 2008, and Windows XP operating systems.

Start FactoryTalk View Studio

To start FactoryTalk View Studio, from the Windows Start menu, select **Programs**, and then click **FactoryTalk View Studio.**

FactoryTalk View comes with several sample applications. We suggest you open the InstantFizz_ME sample application now to use while you try out the instructions in the remainder of this chapter. See Open sample applications on page 40.

Exit FactoryTalk View Studio

To exit FactoryTalk View Studio, from the **File** menu, select **Exit**.

If there are any unsaved changes in open editors, FactoryTalk View Studio asks you whether to save the changes before exiting the program.

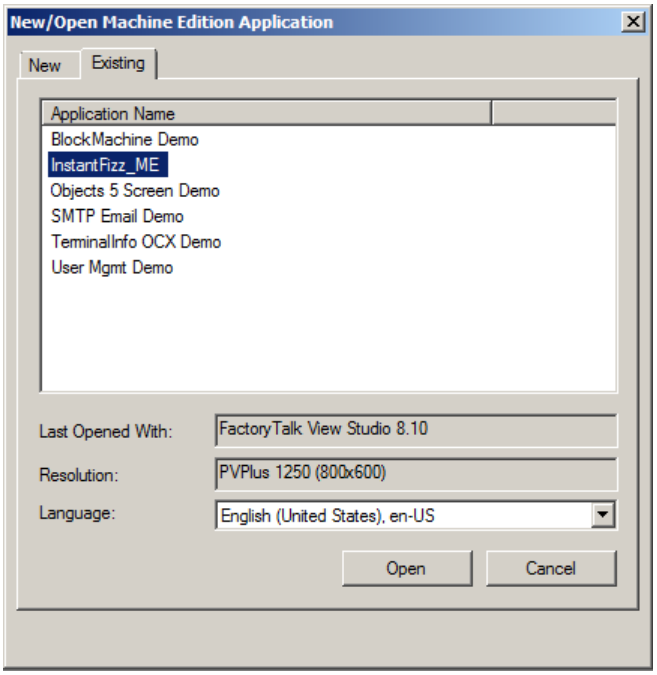
Open sample applications

The sample application is designed for screen resolution 800 x 600.

When you first install FactoryTalk View, sample applications are accessible to all users. For information about setting up users and granting them access to applications, see Set up security on page 175.

To open the InstantFizz_ME sample application

1. Start FactoryTalk View Studio.



2. In the **Existing** tab, select **InstantFizz_ME**.

3. Specify a language for the application, and then click **Open**.

   FactoryTalk View Studio shows the sample application in the Explorer window.

Problems opening applications

If you have trouble opening an application in FactoryTalk View Studio, the problem could be a Microsoft Windows security setting. You must have read and write access to the folder that contains the HMI projects. For example, if you belong to the Windows user group called Power Users, and the group does not have write access to the HMI projects folder, you won't be able to open applications in FactoryTalk View.

The default location for the HMI projects folder is:

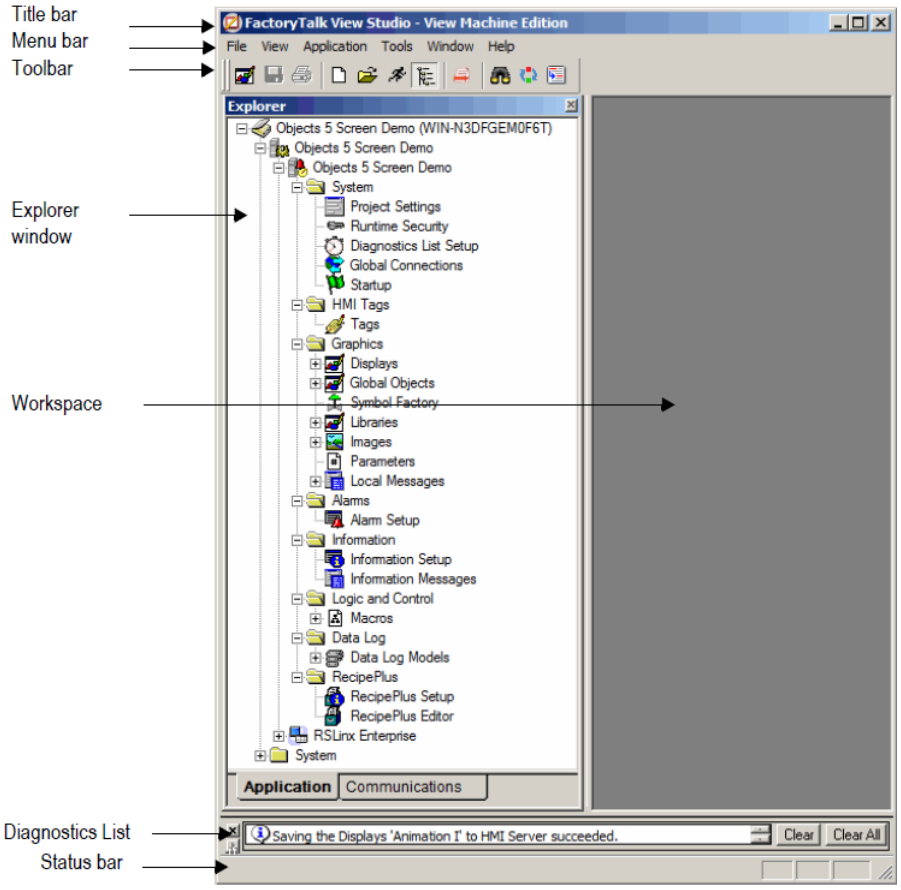
- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **Users\Public\Public Documents\RSViewEnterprise\ME**

For more information about security, see Set up security on page 175.

To set up write access for any Windows Security Group

1. Right-click the HMI projects folder, and then select **Properties**.
2. In the **Security** tab of the **Properties** dialog box, select a Windows Security Group (for example, Power Users) from the list of groups and user names.
3. In the **Permissions** box below the list, select **Full Control**, and then select **Allow**.

Explore the FactoryTalk View Studio main window

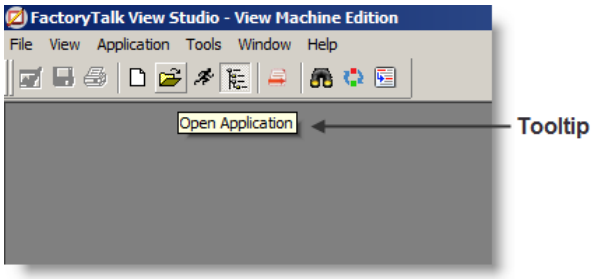


The menu bar

The menu bar contains the menu items for the active window. Each editor has its own set of menus.

The toolbar

The toolbar contains buttons for commonly used menu items so you can have quick access to the items without opening the menu. When you point to a button on the toolbar, the button name is shown in a tooltip and in the status bar.



All editors use the Standard toolbar. The **Graphic Displays**, **Graphic Libraries**, **Runtime Security**, and **Tags** editors have additional toolbars.

The Explorer window

The Explorer window has two tabs: the Application tab, and the Communications tab.

The Application tab contains the editors for creating and editing your application. It also contains the System folder for setting up FactoryTalk Security.

The Communications tab contains the communications tree for the development computer. For more information about using the communications tree, see Help for RSLinx Enterprise.

For more information about the Explorer window, see Use the Explorer window on page 45. For information about setting up security, see Set up security on page 175.

The workspace

The workspace is the blank area of the FactoryTalk View Studio window. You can drag icons from the Explorer window to the workspace to open

editors and components. For more information, see Use the Explorer window on page 45.

The Diagnostics List

The **Diagnostics List** shows messages about system activities. You can specify the types of messages to show in the Diagnostics List, move the list, resize it, and clear the messages in it.

For information about testing graphic displays, see Test your displays as you work on page 308.

Move the Diagnostics List

You can detach (undock) the **Diagnostics List** from the main window, and then move the list anywhere on the screen.

To undock the **Diagnostics List**, drag the grab bars at the bottom left of the **Diagnostics List**. If you can't see the grab bars, drag the top edge of the **Diagnostics List** to make it a bit larger.

To prevent the **Diagnostics List** from docking automatically while you move it across the screen, hold down the **Ctrl** key on the keyboard while you move the **Diagnostics List**.

When the **Diagnostics List** is undocked, you can make it any size you want, for example to view more than one message at a time. To resize the bar, drag an edge or corner until the bar is the size you want.

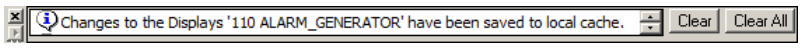
To re-attach the **Diagnostics List**, double-click its title bar.

To clear the selected message in the **Diagnostics List**, click **Clear**.

To clear all the messages in the **Diagnostics List**, click **Clear All**.

Messages in the Diagnostics List

The types of messages that appear in the **Diagnostics List** depend on how you set up FactoryTalk Diagnostics on the development system. For information about specifying the types of messages to show, see Message routing on page 163.

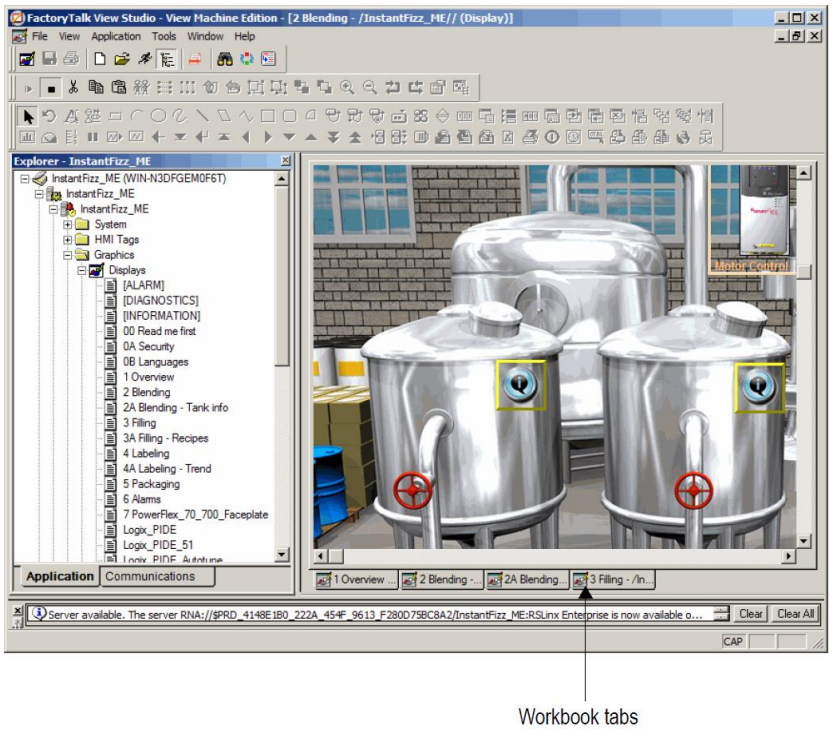


The status bar

The status bar shows information about the active window or about the selected tool or menu item. The information that is shown depends on where the mouse pointer is. For example, when you select a graphic object in the **Graphics** editor, the status bar shows information about the selected object.

Workbook tabs

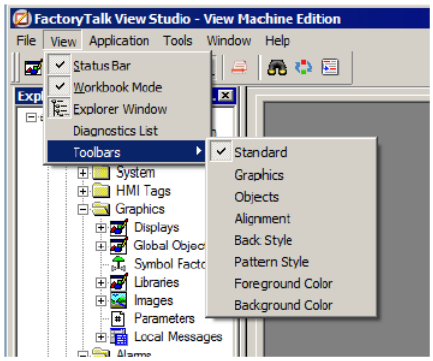
If you select **Workbook Mode** from the **View** menu, the workspace shows tabs at the bottom for each open editor or component. Workbook Mode allows you to bring forward an open item more quickly than by using the **Window** menu.



Show and hide items in the main window

You can show or hide all the items in the main window (except the menu bar) by selecting the items from the **View** menu.

The status bar, Explorer window, Diagnostics List, and Standard toolbar are visible. Workbook Mode is turned on.



To hide or show the Explorer window

- From the **View** menu, select **Explorer Window**, or click the Explorer Window tool on the toolbar.

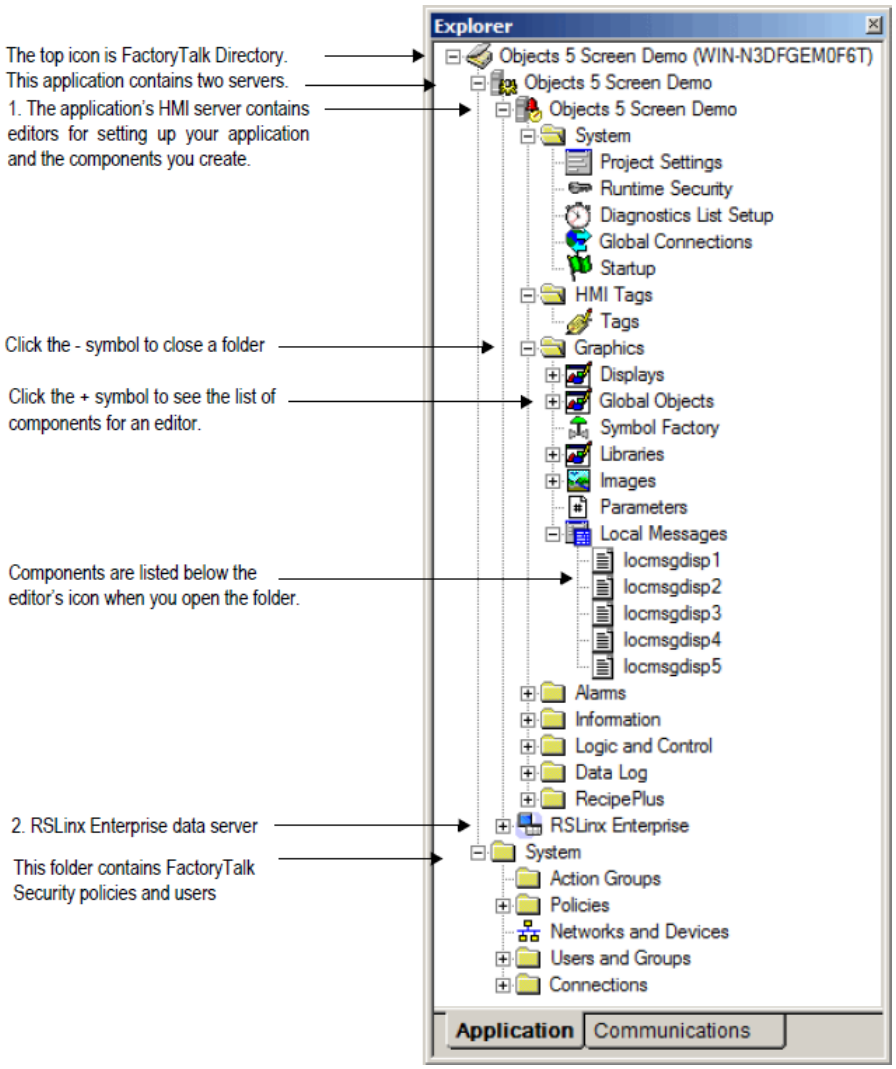
Use the Explorer window

The Explorer window is the main tool for working with FactoryTalk View Studio. It lists the editors you use to develop your application, as well as the components, such as graphic displays, you created.

Use the Explorer window to set up security for your application. You can use the window to set up users and user groups, and to assign security access to FactoryTalk® Directory to the application, and to networks and devices. For information about setting up security, see Set up security on page 175.

An application consists of one or more data servers and an HMI project (also known as an HMI server). The data servers provide communications for the project. The project consists of graphic displays, alarm information, user information, and other settings.

This manual generally uses the term application to refer to both application-level and project-level procedures.



View the Explorer window

You can view the Explorer window in a number of ways:

- As a docked window. When docked, the explorer is always on top of other windows that it overlaps. You can dock the explorer to any edge of the main window.
- As a floating window. When floating, the explorer is always on top of other windows that it overlaps, but you can move it to different locations in the main window.
- As a child window. When the explorer is in child mode, you can minimize the explorer or position other windows in front of it. This

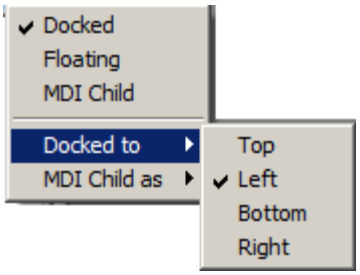
mode is particularly useful when you are working in multiple editors or working with the Help open.

To put the explorer in child mode, right-click the Explorer window title bar, and then select **MDI Child**.

Move and resize the Explorer window

You can move the Explorer window in a number of ways:

- Click the title bar and drag.
- Right-click the title bar, then select a new docking location, floating, or child mode.



You can resize the Explorer window by dragging its edges.

Work with editors

When developing an application, you will use many different editors, but they have many similar features and often require similar information. Knowing how to use these features saves time.

For information on working with particular editors, see the chapters later in this guide.

Locate editors

The editors are grouped in folders in the Explorer window (see Use the Explorer window on page 45). Each editor is shown with an icon to the left of the editor name.

To open a folder in the Explorer window

- Click the + symbol to the left of the folder icon, or double-click the folder name.

View an editor's components

With some editors you enter information in a single window or a tabbed dialog box. Other editors allow you to create multiple components, such as graphic displays or message files. Each component is stored in a separate file, with its own name.

You can create components in these editors:

- **Graphics** (components include graphic displays, global object displays, and graphic libraries, each in their own folder)
- **Alarms**
- **Parameters**
- **Local Messages**
- **Information Messages**
- **Data Log Models**
- **Macros**
- **RecipePlus**

The Explorer window lists the components you create under the icon for the editor you used to create the component.

Use the Images editor to copy bitmap images into your application (but not to create new images). Each image you copy is listed as a component under the editor.

To view a list of components for an editor

- Click the + symbol to the left of the editor icon, or double-click the editor name.

For information about working with components, see Work with components on page 294.

Open editors

Use the editors in FactoryTalk View Studio to create or modify application components. Editors are represented by icons in the Explorer window, or by items in menus.

To open an editor

Use one of these methods:

- Double-click on one of the components in an application (for example, a display).
- Drag the editor's icon from the Explorer to the workspace.
- Right-click the editor's icon, and then click New or Open.

  Note: If the editor can create multiple components, the shortcut menu contains New. If the editor can only open a single component, the menu contains Open.

- From the **Tools** menu, select the editor you want to open.

Close editors

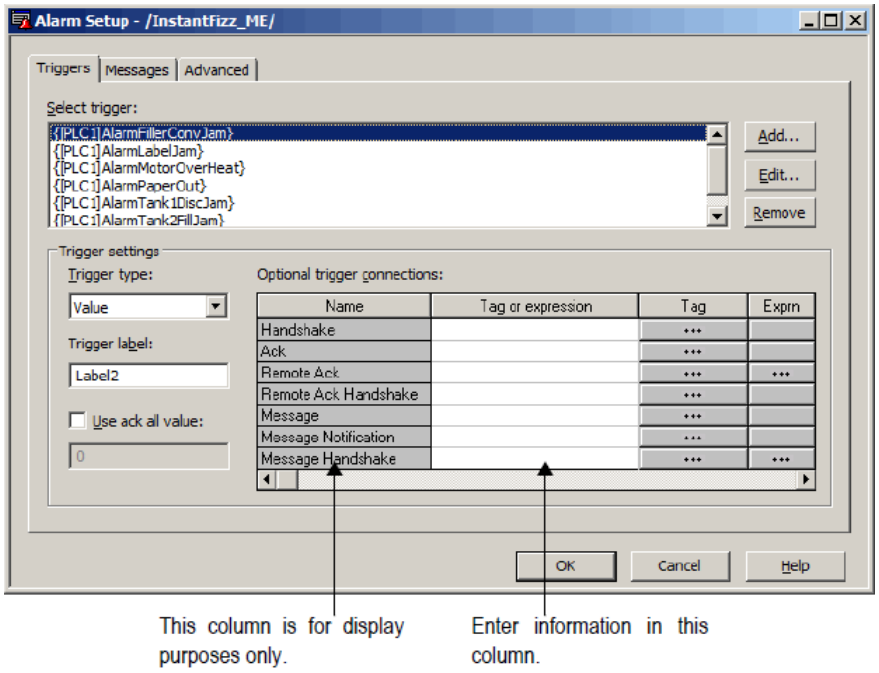
To close an editor

- Click the close button on the editor's title bar, or From the **File** menu, select **Close**.

  Some editors have an **OK**, **Cancel**, or **Close** button that you can click to close the editor.

Enter information in spreadsheets

Some editors contain spreadsheets for entering information. You can enter information in the white columns. Gray columns show information; you cannot enter information in them.



These editors contain spreadsheets:

- **Tags**

- **Runtime Security** (formerly User Accounts)
- **Global Connections**
- **Local Messages**
- **Alarm Setup**
- **Information Setup**
- **Information Messages**
- **Macros**
- **RecipePlus Editor**

In the **Graphics** editor, many of the **Properties** dialog boxes for setting up graphic objects contain spreadsheets for assigning tags or expressions to the objects.

To enter information in a cell in a spreadsheet

- Click the cell, and then type the information. If the cell already contains text, the new information is added after the current text.

  In the **Property Panel**, double-click the cell and then type the information. If the cell already contains text, double-clicking highlights the text and typing replaces the highlighted text.

To move to the next cell in the row

- Press **Tab** or **Enter**.

  The method to use depends on which editor you're working in.

To move to the first cell in the next row

- Press **Enter** or **Down Arrow**.

  The method to use depends on which editor you are working in.

To delete a cell's contents

- Click the cell, and then press **Delete** or **Backspace**. Pressing **Backspace** removes the characters one by one.

  The method to use depends on which editor you are working in.

To delete rows

- Select one or more rows, right-click the selection, and then select **Delete Rows**.

Print

Each component has a **Print** item on its **File** menu.

To print an editor's contents

1. Open the component.
2. From the **File** menu, select **Print**.
3. Click **OK**.

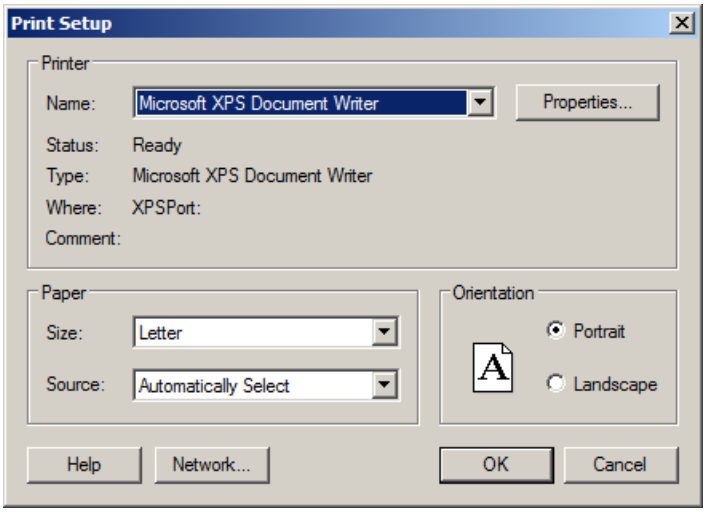
Select a printer

You must install a printer before you can select it. For information about installing a printer, see your Windows documentation.

The **Print Setup** menu item in FactoryTalk View Studio applies to your development computer only. To print at run time, set up a printer on the computer or PanelView Plus terminal you use to run your application. For more information about printing at run time, see Print at run time on page 52.

To select a printer

1. From the **File** menu in any editor or component, select **Print Setup**.



2. If you don't want to use the default printer, specify another printer.
3. Choose the appropriate paper and orientation options.

4. Click **OK**.

Select printer setup options

For detailed information about printer options, refer to your Windows documentation.

Select a network printer

FactoryTalk View Studio can print to a network printer. For detailed information about setting up network printers, refer to your Windows documentation.

Print at run time

Print graphic displays at run time using the display print button or using a remote display print. You can also send diagnostics and alarm messages to a printer at run time.

For information about	See
Display print buttons	To print graphic displays at run time, use one or both of these methods on page 330
Print graphic displays	Print displays at run time on page 330
Print displays remotely	Print displays on page 329
Print alarm messages	Methods for printing alarm information on page 128
Print diagnostics messages	Show and print diagnostics messages at run time on page 169
Specify the printers to use at run time for Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008 applications	Specify the printers to use at run time on page 238
The type of printer to use with a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal	Install hardware and software on a PanelView Plus terminal on page 248

Plan applications

A well-designed application requires planning. To help you plan, this chapter describes:

- Understand the machines and processes you're automating
- Collect data
- Design an HMI tag database
- Plan graphic displays and navigating between them
- Plan languages
- Plan alarms
- Provide information for the operator
- Plan trends
- Plan recipes
- Design a secure system

FactoryTalk View comes with several sample applications that can give you guidance when planning your application. For instructions on opening the sample applications, see Open sample applications on page 40.

Understand the process

Gather information from a variety of sources so you have a complete and detailed understanding of the machines and processes you're automating.

To gather information:

- Talk to machine operators and other experts who are going to use the system. Find out what information they need to optimize machine operations and processes.
- Talk to management and management information systems staff to find out what information they need to support planning decisions.
- Break up each section of the process into its constituent parts.
- Determine what type of communications you'll be using — which network types, data servers, and devices.
- Determine which process variables you need to have access to and identify their locations in the programmable controllers.

Collect data

When planning data collection, design your system so only essential data is collected. Limiting data collection is important because collection activities require substantial processing power and generate a lot of traffic on the network.

Keep data collection requirements in mind when designing the layout of the programmable controller data tables and the HMI tag database. Ideally, tag addresses reference contiguous blocks of programmable controller data tables to reduce highway traffic and optimize system response. If you're going to use data from an OPC server, read the server documentation to find out how to optimize traffic.

Design an HMI tag database

Take the time to plan your HMI tag database. A good design helps reduce the time required for maintenance and can improve programmable controller-to-FactoryTalk View response time.

For information about creating HMI tags, see Use HMI tags on page 97.

Note: If you are going to use direct referencing for all your tags, you don't need to create HMI tags in FactoryTalk View.
Data Server tags usually update faster than HMI tags. To obtain the best system performance for your application, use Data Server tags where possible.

For information about creating Data Servers to data server tags, see Work with tags on page 85.

Collect information

Before you begin creating the tag database, collect:

- Flowcharts of your processes (or process and instrument diagrams).
- A list of programmable controller data table or register addresses your application will have access to.
- Machinery systems documentation.
- Alarm requirements (for more information, see Plan alarms on page 58).

Organize tags

Before creating tags:

- Develop naming conventions for tags, choosing names that are familiar and logical to everyone. This makes troubleshooting easier.
- Group related tags.

Group tags in the way that makes the most sense for your application. For example, group all similar devices or group related areas of the plant floor.

When creating tags, place related tags into folders. For greater organization, nest folders.

Plan graphic displays

When planning displays, determine the best way for users to navigate through your displays and develop a template to establish a common look and feel for your displays.

Also consider factors about the runtime terminal that affect how the application is shown and used, such as:

- Screen size
- The maximum number of displays supported at run time
- If the applications runs on a personal computer, the maximum number of displays is based on the type of activation used
- If the application runs on PanelView Plus, the maximum number of displays is based on the amount of memory used by the application. Applications run on a PanelView Plus can contain as many displays as can fit in the memory of the PanelView Plus terminal.
- PanelView Plus 7 Standard applications, and Compact Machine Edition applications have a limit of 25 displays.
- Whether the operator will be using a keyboard, touch screen, mouse, or combination of navigation and data entry methods.

For information about creating graphic displays, see Use graphic displays on page 299.

Develop a hierarchy of displays

A hierarchy of displays is a series of graphic displays that provide progressively more detail as users move through them. Design your display hierarchy to meet the needs of the various users, including managers, supervisors, and operators.

Well-organized graphic displays present information clearly and consistently and guide users through the system. Before designing individual graphic displays, plan an overall display hierarchy and plan how users will navigate through the hierarchy.

For information about navigation methods and developing a hierarchy of displays, see Set up global connections on page 111.

Create a template to ensure consistency

It is possible to keep a consistent appearance among all the displays in an application by presenting the same pieces of information in the same place on each graphic display. To ensure uniformity, develop a display with common elements that acts as a template. Each time you develop a new display, start with a duplicate of the template.

For example, the template could contain:

- Your company logo.
- A title.
- The date and time.
- Navigational buttons.

Use global object displays to create template objects. You can copy the objects into your graphic displays, and update all the objects at once by updating the original object in the global object display. For information about creating global object displays, see Create global object displays and base objects on page 510.

Design displays

When designing displays, applying good visual design principles helps users and increases their efficiency.

Remember these important design principles:

Consistency

- Be consistent with your use of symbols and color.
- Be consistent with button labels and button placement.

  When you design several displays, place the same kinds of buttons in the same positions. For example, if you have a Start button in a certain position in one display, don't put a Stop button in the same position in the next display.

Clarity

- Use symbols that are easily recognizable. For example, use the conventional ISA symbols for tanks and valves.
- Don't overload the screen with information.
- Use standard, clear terminology, and avoid abbreviations or acronyms that the user might not understand.

- Use colors with recognizable meanings. For example, in North America the colors red and green usually mean stop and start. Keep color meanings consistent by assigning red only to Stop buttons, and green only to Start buttons.

  Some people are color blind to red and green so don't rely on color alone to establish meaning.

- Use high contrast color combinations, such as yellow on blue.

Display types

- On Top display type is used to position the display in front of any other display that is already open at runtime.
- Replace display type is used to have the display close any open displays on the screen at runtime. Replace displays do not close displays of the type On Top that have the **Cannot Be Replaced** option selected. Only one Replace display can be open at a time.

Usability

- If you're designing for a touch screen, don't place important buttons where they'll be blocked by an On Top display. The user can't press a covered button. Also, ensure the button is large enough for users to touch easily.
- Ensure there is always a clear way to move between displays.
- Keep the intended user in mind and design displays so they are easy to understand and use. Ask the users to test the displays.

Plan languages

Before setting up languages, plan:

- Which languages you need to use
- Which Windows fonts support these languages
  - For applications running on a personal computer which Windows fonts support these languages
  - For applications running on a PanelView Plus terminal which languages the fonts resident on the terminal support
- How different languages will affect design elements in your graphic displays, such as object size and message length
- Whether operators need to switch languages at run time, and if so, under what conditions. This will help you determine where to locate **Language Switch** buttons in your application
- How to show operators which button to press to switch to their languages. For example, by using a text label in French, or a French flag, to alert a French operator

For information about setting up language switching, see Set up language switching on page 197.

Plan alarms

Before setting up alarms, plan:

- What conditions will trigger alarms
- How operators will be notified of alarms
- What information you want alarm messages to contain
- How operators will respond to alarms
- The maximum number of alarm messages supported at run time

For information about setting up alarms, see Set up alarms on page 119.

Provide information for the operator

In addition to notifying the operator of alarm conditions, you can provide information and instructions about plant processes, and inform the operator about system activities.

Before setting up information notification, plan:

- What system activity the operator needs to be informed about
- What conditions will trigger information messages
- What information you want the messages to contain

Local and information messages

Use local messages to give the operator information in a specific graphic display while the display is open. Use information messages to give the operator information no matter which display is open.

For information about setting up local messages, see Use local messages on page 325. For information about setting up information messages, see Use information messages on page 525.

Diagnostics messages

Set up diagnostics messages to notify the operator of system activity such as tag reads and writes, running macros, communication problems, or problems opening displays.

For information about setting up diagnostics messages, see Set up FactoryTalk Diagnostics on page 161.

Plan trends

When planning trends, consider how they will be used. For example, will the trend be used to:

- Analyze process trends?
- Monitor production efficiency?
- Archive process variables to ensure compliance with government regulations?

Based on such considerations, you can determine:

- Which tags need to be plotted on the same trend.
- Which tags need to be logged by using a data log model.

For information about setting up data logging, see Set up data logging on page 519.

For information about creating trend graphic objects, see Set up trends on page 535.

Plan recipes

When planning recipes, consider how they will be used. For example, will recipes be used to:

- Compare tag values to pre-set data values?
- Upload tag values to existing or new data sets?
- Download values from data sets to tags?
- Archive tag values to ensure compliance with government regulations?

Based on such considerations, you can determine:

- Which tag sets and data sets to pair together in a recipe file.
- Which **RecipePlus** button actions to use with the **RecipePlus** selector and **RecipePlus** table.

For information about using recipes and creating **RecipePlus** graphic objects, see Set upi ReciplePlus on page 547.

Design a secure system

When deciding on your security requirements, consider whether to:

- Restrict access to every graphic display to prevent accidental changes.
- Restrict access to certain graphic displays.
- Have everyone log on.
- Use passwords, and if so, whether to have a minimum length, and whether to require that the passwords are changed periodically.
- Allow only authorized users to shut down the application.
- Use the DeskLock tool on Windows platforms to prevent users from switching to another application at run time (for applications that will

run on personal computers). You can use this tool to set up a customized desktop and to prevent access to Windows® functions.

Based on these considerations, you can set up security for individual users or groups of users. For example, you might want to set up groups of users such as a manager group and an operator group.

For more information about setting up security, see Set up security on page 175.

Work with applications

This chapter describes:

- Application files
- Create, import, open, and close applications
- Rename, copy, delete, back up, and restore applications
- Specify project settings
- View application properties
- View HMI server properties

What is an application?

An application is the software application you create in FactoryTalk View Studio to monitor and control your plant processes. An application consists of one or more data servers and an HMI project (also known as an HMI server). The data servers provide communications for the project. The project or HMI server consists of graphic displays, alarm information, user information, and other settings.

For information about viewing the application properties, see View application properties on page 77. For information about viewing the HMI server properties, see View HMI server properties on page 77.

Application versus project

This manual generally uses the term application to refer to both application-level and project-level procedures. There is an exception on using the **Project Settings** editor. See About project settings on page 72. In that section, the term project is used.

When you create an application, FactoryTalk View creates folders and files in various locations on the development computer. Some of the folders are empty until you start setting up your application. When you finish developing the application, FactoryTalk View uses the information in the various folders and files to create the runtime application.

HMI project file

The HMI project file has the extension .med. The HMI project file is located in this directory:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects**

Runtime application file

The runtime application consists of a file with the extension .mer. For information about creating the runtime application, see Create runtime applications on page 221.

Component files

Component files are located in folders in the HMI project folder, as described in the following table. For example, graphic display component files (with the extension .gfx) are stored in the Gfx folder. You might need to navigate to the location of these files, for example if you are adding a component from one application into another application.

This folder	Contains	File extensions
Application name	HMI project file and the folders described below	.med
DLG	Data log models (component files)	.mdf
Gfx	Graphic display component files	.gfx
Global Objects	Global object display component files	.ggfx
Images	Image files	.bmp, .png, or .jpg
Information	Information message component files	.ifm
Local	Local message component files	.loc
Macros	Macro component files	.mcr
PAR	Parameter component files	.par
RecipePlus	RecipePlus component files	.rpp

External folders

The following table lists some FactoryTalk View folders that are external to the HMI project folder, and the types of files they contain.

The folders are located in this directory:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\PublicDocuments\RSView Enterprise**

This folder	Contains	File extensions
Images	Image files for use on graphic objects	.bmp
ME\Archives	ME archive application files	.apa
ME\Libraries	Graphic library component files and image files used in the library displays	.gfx .bmp
ME\Logs*Runtime Application Name*\Dlglog*Data Log Model Name*	Data log files for applications that have run on the development computer	.log .tag
ME\Logs*Runtime Application Name*\M_Alarms	Alarm log file for applications that have run on the development computer	.alm
ME\Runtime	Runtime application files	.mer
ME\HMI projects	Sample application folders, including all files and folders needed for the sample	
ME\Faceplates	Graphic displays and global object displays for Logix5000 faceplates	.gfx .ggfx .bmp

If desired, you can specify a different directory in which to store graphic library component files. For more information, see Location of library components on page 318.

Default log file locations for PanelView Plus 7, PanelView Plus 6, PanelView Plus, or PanelView Plus CE applications

On the PanelView Plus 7 or PanelView Plus 6 terminal, alarm and data log folders are located by default in this directory:

\Windows\Logs

On the PanelView Plus or PanelView Plus CE terminal, the alarm and data log folders are located by default in this directory

\Storage Card\Rockwell Software\RSViewME\Logs

Data log file locations

You can also store data log files in a different location on the runtime computer, on a networked computer, or on a PC card. For more information, see Set up data logging on page 519.

Name files

File names, including the path, can be up to 200 characters long (file names can contain spaces). For example, the following path and file name contains 119 characters:

C:\Documents and Settings\All Users\Documents\RSView Enterprise\ME\HMI projects\Malthouse Clgx 640x480\Gfx\Steeping.gfx

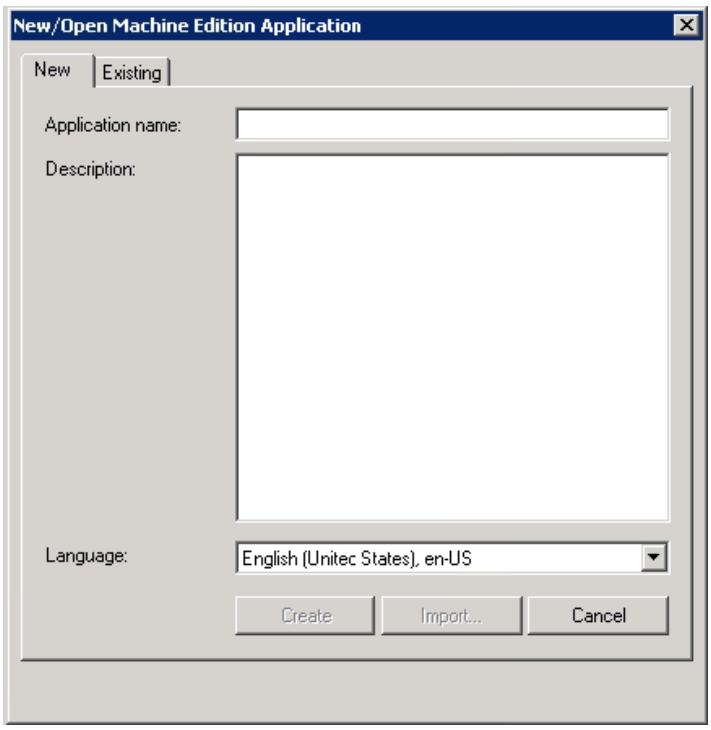
Creat, import, open, and close applications

Creat applications

You can create a new application when you start FactoryTalk View Studio, or once FactoryTalk View Studio is already open.

To create a new application when you start FactoryTalk View Studio

1. Start FactoryTalk View Studio.



2. In the **New** tab, in the **Application name** box, type a name for your application, up to 32 characters long.

3. If desired, type a description of the application. If you don't type a description now, you can add one later, as described on To view application properties on page 77.

4. Specify a language for the application. For information about using different languages, see Set up language switching on page 197.

5. Click **Create**.

   FactoryTalk View Studio creates the application's folders and files, and then shows the new application in the Explorer window.

The application is created in the **ME\HMI projects** directory, in a folder with the same name as the application name.

This is the path to the **ME\HMI projects** directory:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects**

- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects**

Once you create the application, the system automatically creates a display called **MAIN** and sets the **Projects Settings**, startup Graphic to Main. These settings determine the general appearance of your runtime application, and affect how your graphic displays look. For more information, see Specify project settings on page 76.

To create a new application when FactoryTalk View Studio is already open

1. From the **File** menu, select **New Application**, or click the **New Application** tool .

   If an application is already open, FactoryTalk View Studio asks you whether to close the application that is currently open. Click **Yes**.

2. Follow steps 2 through 5 in the previous procedure.

Import applications

You can import PanelBuilder, PanelBuilder32, PanelBuilder 1400e, and FactoryTalk View Machine Edition applications into FactoryTalk View Studio.

PanelBuilder and PanelBuilder32 files can be in either development format (*.pba) or runtime terminal format (*.pva). PanelBuilder 1400e files have the file extension *.pvc.

When you import older application files, FactoryTalk View creates a copy of the application for the current version of FactoryTalk View. The older version is not altered.

You can use current version application files to create previous version runtime files. For more information, see Open and edit applications from earlier versions of RSView or FactoryTalk View ME on page 70.

If the application you are importing contains any direct driver nodes, the import wizard will create one RSLinx topic for each direct driver node it finds. All topics are then converted into device shortcuts, to run with RSLinx Enterprise. You must have both RSLinx Classic and RSLinx Enterprise installed to make this two-step conversion.

To create RSLinx topics after import, follow these steps in RSLinx before importing the application.

To validate direct driver nodes in RSLinx

1. Create the appropriate RSLinx Classic drivers if not already created (for example, AB_ETH-1).
2. For more information about creating RSLinx Classic drivers, see the RSLinx Classic Help.
3. If it is an Ethernet driver (AB_ETH-1), add the IP address of each direct driver node to the Ethernet driver setup.
4. Start RSWho and select each device associated with each direct driver node (for example, 131.200.13.128).
5. If these steps are not followed in this order, the topics generated by the import code will be invalid and will need to be fixed using the Topic Editor in RSLinx.

To import an application

1. Start FactoryTalk View Studio
2. In the **New** tab, in the **Application name** box, type a name for the imported application, up to 32 characters long.
3. If desired, type a description of the application. If you don't type a description now, you can add one later, as described on To view application properties on page 77.
4. Specify a language for the application. For information about using multiple languages, see Set up language switching on page 197.
5. Click **Import**. The Machine Edition Import Wizard opens.
6. Follow the directions in the Machine Edition Import Wizard.
7. For more information about importing PanelBuilder 1400e applications, see Convert PanelBuilder 1400e applications on page 565.

   For more information about importing PanelBuilder and PanelBuilder32 applications, see Convert PanelBuilder and PanelBuilder32 applications on page 581.

Open applications

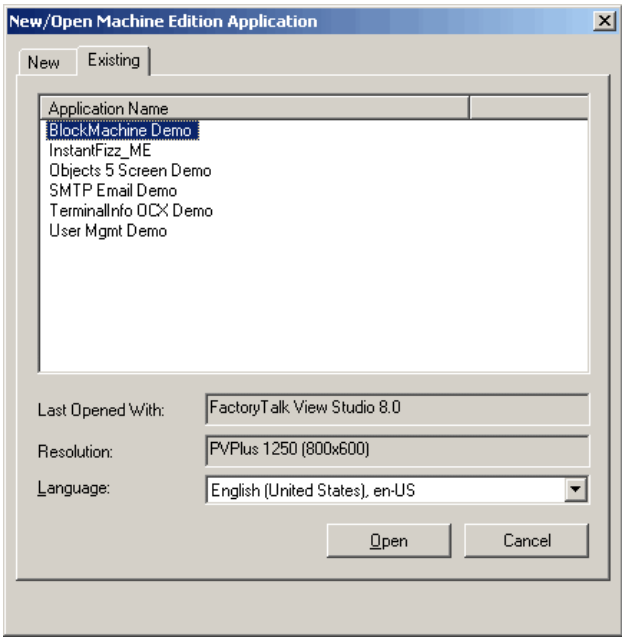
You can open an application when you start FactoryTalk View Studio, or once FactoryTalk View Studio is already open.

Older RSView Machine Edition application files are converted to the current version of FactoryTalk View when you open them. However, you can still use the current version of FactoryTalk View Studio to create older version runtime files. For information about the features supported in different versions of FactoryTalk View, see Features supported in different versions of FactoryTalk View on page 605.

For information about opening a sample application, see Open sample applications on page 40.

To open an existing application when you start FactoryTalk View Studio

1. Start FactoryTalk View Studio.



2. In the **Existing** tab, select the application to open.

   When you select an application from the **Existing** tab, the resolution and version that was last used to open the application is shown.

3. Specify a language for the application, and then click **Open**. For information about using different languages, see Set up language switching on page 197.

4. If this is the first time you are opening an application that was created in an earlier version of the software, you may be prompted to select a default language. Select a language, and then click **OK**. For information about the default language, see The default language on page 198.

FactoryTalk View Studio shows the application in the Explorer window.

To open an existing application when FactoryTalk View Studio is already open

1. From the **File** menu, select **Open Application**, or click the **Open Application** tool .
2. If an application is already open, FactoryTalk View Studio asks you whether to close the application that is currently open. Click **Yes**.
3. Follow steps 2 through 4 in the previous procedure.

To open an application you used recently

1. From the **File** menu, select **Recent Applications**, and then click the name of the application to open.
2. If an application is already open, FactoryTalk View Studio asks you whether to close the application that is currently open. Click **Yes**.

   The application opens. For applications with multiple languages, the language you used most recently opens. For information about using different languages, see Set up language switching on page 197.

Problems opening applications

If you have trouble opening an application in FactoryTalk View Studio, the problem could be a Microsoft Windows security setting. You must have read and write access to the folder that contains the HMI projects. For example, if you belong to the Windows user group called Power Users, and the group does not have write access to the HMI projects folder, you won't be able to open applications in FactoryTalk View.

The default location for the HMI projects folder is:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\ME**

For more information about security, see Set up security on page 175.

To set up write access for any Windows Security Group

1. Right-click the HMI projects folder, and then select **Properties**.

2. In the **Security** tab of the **Properties** dialog box, select a Windows Security Group (for example, Power Users) from the list of groups and user names.

3. In the **Permissions** box below the list, select **Full Control**, and then select **Allow**.

Open multiple applications

To open two applications at the same time, for example to copy images and graphic objects between applications, start two instances of FactoryTalk View Studio.

Note: To view a graphic display in different languages at the same time, open the application multiple times, selecting a different language each time you open it.

Open and edit applications from earlier versions of RSView or FactoryTalk View ME

You can open and edit applications from RSView 3.10, 3.20, and FactoryTalk View 4.0, 5.0, 6.0, 6.10, 7.0, and 8.0. When you are finished editing, you can create runtime application files for ME Station version 3.10, 3.20, 4.0,5.0, 5.10, 6.0, 6.10, 7.0, and 8.0. This allows you to continue running your applications on existing terminals, without upgrading all your software.

The application is converted to the current version of FactoryTalk View when you import it, but when you create the runtime application file you can save it back to the earlier version.

If the application uses a feature that is not supported by the runtime version, you will not be able to create the runtime application file. The exceptions are multiple languages, and global objects. When you create the runtime application file, it uses the application's current language. You can create as many different runtime application files, in as many different languages, as you want. However, the language switch feature is not available at run time for version 3.10, and 3.20 applications. Global objects are converted to regular objects in the runtime application file for versions 3.10, and 3.20.

For information about importing applications, see Import applications on page 66.

For information about the features supported in different versions of FactoryTalk View and RSView, see Features supported in different versions of FactoryTalk View on page 605.

For information about using multiple languages, see Set up language switching on page 197.

For information about using global objects, see Use graphic displays on page 299.Panel

Close applications

To close an application

- From the **File** menu, select **Close Application**.

  If there are any unsaved changes in open editors, FactoryTalk View Studio asks you whether to save the changes before closing the application.

To close an application and exit FactoryTalk View Studio at the same time

- Click the **Close** button at the right end of the FactoryTalk View Studio title bar .

  If there are any unsaved changes in open editors, FactoryTalk View Studio asks you whether to save the changes before closing.

Rename, copy, delete, back up, and restore applications

Use the Application Manager tool to:

- Rename applications
- Copy applications
- Delete applications
- Create a compressed backup copy of an application, with the file extension .apa
- Restore an application from the backup file, with the file extension .apa
- Restore a legacy project backup file (with the file extension .mea) from an earlier release of FactoryTalk View Studio, and convert it to the current version
- Restore a runtime application file, with the file extension .mer, to a development application, with the file extension .med. For more information, see Convert runtime application files to development applications on page 226.

To start the Application Manager tool, do one of the following

- In FactoryTalk View Studio, from the **Tools** menu, select **Application Manager**.
- From the Windows Start menu, select **Programs > Rockwell Software > FactoryTalk View > Tools > Application Manager**.

For details about using the tool, see the Application Manager Help.

About project settings

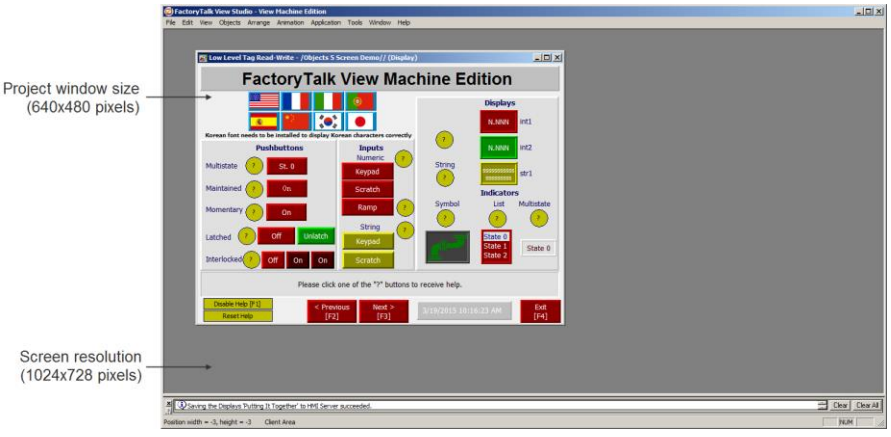
Project settings determine the general appearance of your runtime application, such as the size and position of the project window and whether a title bar appears in the project window. You can also change the setting for running Compact Machine Edition applications, and enable automatic logout of the current user.

Since project settings affect how your graphic displays look, specify the settings before creating graphic displays.

Project window size and runtime screen resolution

This section describes the difference between project window size and runtime screen resolution, and describes how these two settings can affect the behavior of your application at run time.

The project window size is the amount of room your application occupies on the runtime terminal or computer screen, in pixels. The runtime screen resolution is the actual size of the runtime terminal or computer screen, in pixels. Therefore, the project window size must be less than or equal to the runtime screen resolution.



Usually, an application is designed to completely fill the runtime terminal or computer screen. If you want your application to do this, set the project window size to the resolution of the screen in pixels. For information on setting the project window size, see Specify project settings on page 76.

Screen resolution for PanelView Plus 7, PanelView Plus 6, PanelView Plus, and PanelView Plus CE terminals

If you are going to run your application on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, select one of these project window sizes:

For this terminal or monitor	Select this project window size
PanelView Plus 400 or 600 PanelView Plus Compact 400 or 600 PanelView Plus 6 400 or 600 PanelView Plus 6 Compact 400 or 600	320x240
PanelView Plus 7 Standard 4" Wide	480x272
PanelView Plus 700 or 1000 PanelView Plus CE 700H or 1000H PanelView Plus Compact 1000 PanelView Plus 6 700 or 1000 PanelView Plus 6 Compact 1000 PanelView Plus 7 Standard 6" or 7" PanelView Plus 7 Performance 6" or 7"	640x480
PanelView Plus 7 Standard 9" Wide PanelView Plus 7 Performance 9" Wide	800x480
PanelView Plus 1250 PanelView Plus CE 1250H PanelView Plus CE 1200P, 1200M, or 1200W PanelView Plus 6 1250 PanelView Plus 7 Standard 10" PanelView Plus 7 Performance 10"	800x600
PanelView Plus 1500 PanelView Plus CE 1500H PanelView Plus CE 1500P, 1500M, or 1500W PanelView Plus 6 1500 PanelView Plus 7 Standard 15" PanelView Plus 7 Performance 15"	1024x768
MobileView PanelView Plus 7 Standard 12" Wide PanelView Plus 7 Performance 12" Wide	1280x800
PanelView Plus CE 1700M PanelView Plus 7 Performance 19"	1280x1024
PanelView Plus CE 2000M	1600x1200 (Custom size)

If you are creating an application for a PanelView Plus 7, PanelView Plus 6, or PanelView Plus 400 or 600 terminal:

- Resize the default message displays so that the entire message is visible.

- Reposition the [ALARM] display from the default position (0, 0), as this position is below the viewing area of the terminals.

Change the project window size after creating graphic displays

The project window size is used for all graphic displays of the Replace type. If you change the window size after you have already created graphic displays, you have the option of scaling graphic displays.

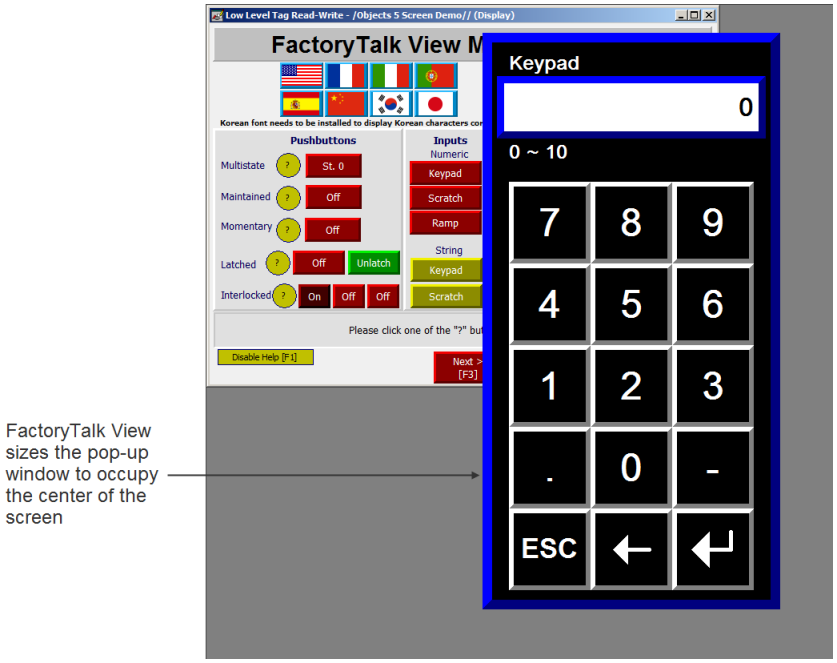
If you choose to scale graphic displays, all Replace and On Top displays are resized and the objects in them are scaled to fit the new size. You can also specify whether to scale the font size and border size of the graphic objects, and the size of graphic images in the Images folder.

If you choose not to scale displays when you change the project window size, Replace displays are resized, but any objects in the displays remain the same size and in the same position as before. On Top displays are not resized.

For more information about Replace and On Top displays, see About display types on page 310. For more information about scaling displays, see Help.

How the runtime screen resolution affects the pop-up windows

FactoryTalk View comes with a pop-up **Login** window, as well as numeric and string pop-up windows for runtime data entry, and a **Change Password** window for changing user passwords at run time.



How the project window size affects the default message displays

Your application comes with pre-configured, default graphic displays for diagnostics, alarm, and information messages. If the project window size is smaller than the default displays, the edges of the displays are cut off at run time.

These are the sizes of the default displays:

Graphic Display	Width in pixels	Height in pixels
[DIAGNOSTICS]	640	160
[ALARM]	640	210
[INFORMATION]	640	80

If your project window size is smaller than the default message display sizes, you can resize the default displays, or use your own displays instead.

PanelView Plus 7 Standard applications and Compact Machine Edition applications

Applications intended for PanelView Plus 7 Standard, PanelView Plus 6 Compact, and PanelView Plus Compact terminals have certain restrictions, such as the number of displays and alarm messages supported.

To change an application to a PanelView Plus 7 Standard application, or a Compact Machine Edition application (application running on PanelView Plus 6 Compact, or PanelView Plus Compact terminals), in the the **General** tab of the **Project Settings** dialog box, from the **Project window size** list, select a **PVPlus Compact**, or a **PVPlus 7 Standard** option.

Title bar

If you select this option, a title bar is used for all Replace graphic displays. For information about graphic display types, see About display types on page 310.

If desired, you can also use a **Control** box, **Minimize** button, and **Close** button on the title bar. The **Close** button appears only if you select the **Control** box in the **Project Settings** editor.

If you plan to set up security for your application and want to prevent unauthorized users from stopping the application, do not use a title bar.

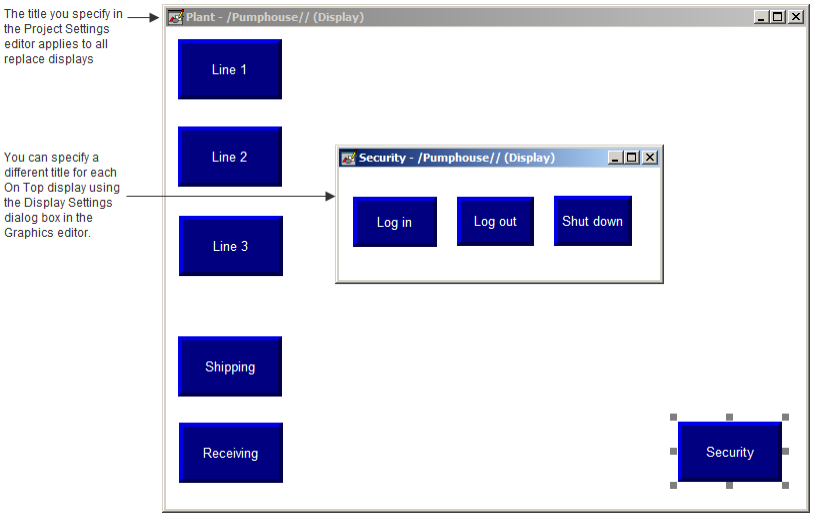
For information about setting up security, see Set up security on page 175.

Change the Title bar or Border setting

If you change the Title bar or Border setting, you have the option of scaling graphic displays to accommodate the new display size. For details, see Help.

Title bar for On Top displays

For On Top displays, you can specify a different name to use in the title bar. Use the **Display Settings** dialog box to specify the name (for details, see Help).


The title you specify in the Project Settings editor applies to all replace displays
You can specify a different title for each On Top display using the Display Settings dialog box in the Graphics editor.
Plant - /Pumphouse// (Display)
Line 1
Line 2
Line 3
Shipping
Receiving
Security - /Pumphouse// (Display)
Log in
Log out
Shut down
Security

Enable auto logout

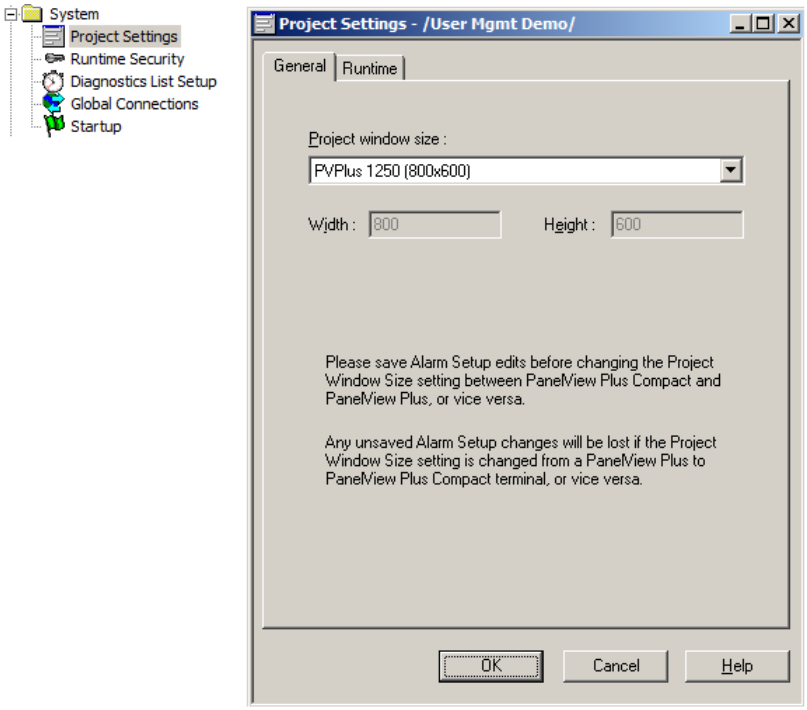
Use the **Project Settings Runtime** tab to log the current user out automatically if the terminal is inactive for a specified period of time. You can set up the terminal to open a particular graphic display after the automatic logout, and you can apply a parameter file or parameter list to the display you select.

If no display is selected, whatever display was open at logout will remain open.

Note that this auto-logout feature that returns to a specific display applies to ALL user accounts including the DEFAULT user account.

Specify project settings

To specify project settings, use the **Project Settings** editor. For details about selecting options in the editor, see Help.


System
Project Settings
Runtime Security
Diagnostics List Setup
Global Connections
Startup
Project Settings - /User Mgmt Demo/
General
Runtime
Project window size :
PVPlus 1250 (800x600)
Width :
800
Height :
600
Please save Alarm Setup edits before changing the Project Window Size setting between PanelView Plus Compact and PanelView Plus, or vice versa.
Any unsaved Alarm Setup changes will be lost if the Project Window Size setting is changed from a PanelView Plus to PanelView Plus Compact terminal, or vice versa.
OK
Cancel
Help

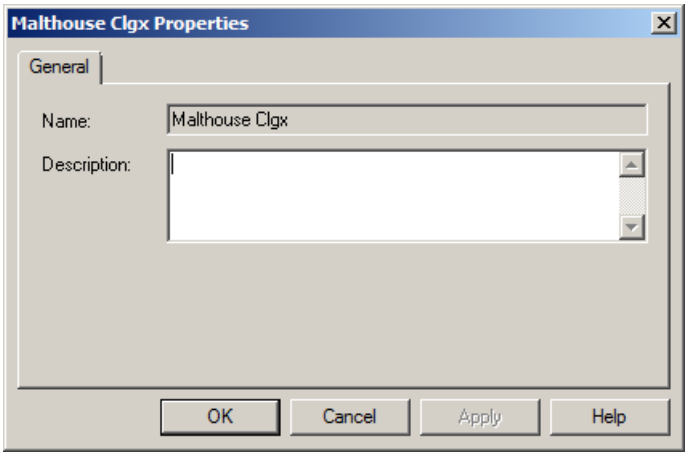
View application properties

You can view this information about your application:

- Application name
- Application description, if any

To view application properties

- From the **Application** menu, select **Application Properties**.

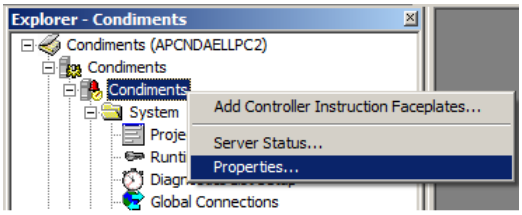


View HMI server properties

You can use the Explorer window to view this information about your project or HMI server:

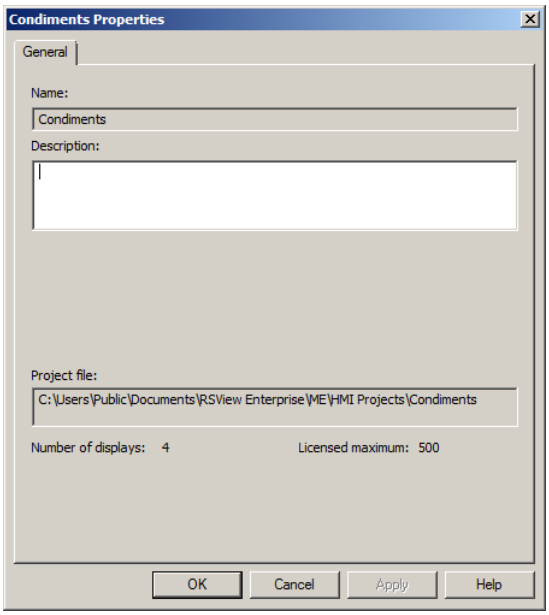
- Application name

- Application description, if any
- Location of the project file
- Number of graphic displays in the application
- Maximum number of displays you're licensed to use



To view HMI server properties

- n the Explorer window, right-click the HMI server name, and then select **Properties**.



Set up communications

This chapter describes:

- Data servers
- OPC (OLE for Process Control) communications
- Creating data servers and setting up communications

About data servers

Data servers provide access to devices, on the network, making it possible to browse, read, and write values from FactoryTalk View applications.

FactoryTalk View ME supports the following types of data servers:

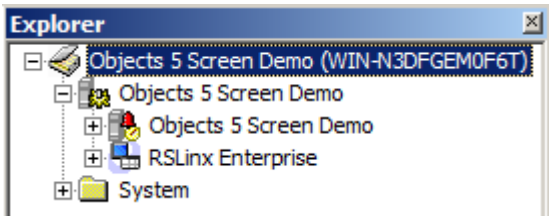
- **Rockwell Automation Device Servers**
  RSLinx Enterprise is the recommended data server for all Rockwell Automation devices and networks. RSLinx Enterprise does not require activation or licensing and can be installed as often as needed in any application.
- **OPC Data Servers** are any data server that supports the OPC-DataAccess Standard v2.05a.
  The OPC Foundation is a non-profit organization that provides standards and technology that enables software from different vendors to work together. The following OPC Data Access v2.05a servers are available with FactoryTalk View ME.
  - **KepServer Enterprise** is used to communicate with non-Rockwell Automation devices like Siemens or Modicon controllers. KepServer Enterprise does not require activation or licensing for FactoryTalk View ME.
  - **RSLinx Classic** can only be used with FactoryTalk View ME Station and should only be considered in the following situations:
    - CIP to non-CIP routing is required to reach the device.
    - Unsolicited messages are used to send data from controllers.
    - Alias topics (multiple paths to the same device) are required.

About OPC communications

FactoryTalk View ME supports OPC communication on the PanelView Plus family of terminals for use with only KEPServer Enterprise. Any OPC Data Access v2.05a compliant server is supported by FactoryTalk View ME Station running on personal computers. RSLinx Classic and KEPServer Enterprise are OPC DA V2.05a compliant OPC servers.

Create data servers

An RSLinx Enterprise data server is created automatically with a new application. It is located under the application's HMI server in the Explorer window, just above the FactoryTalk System folder.



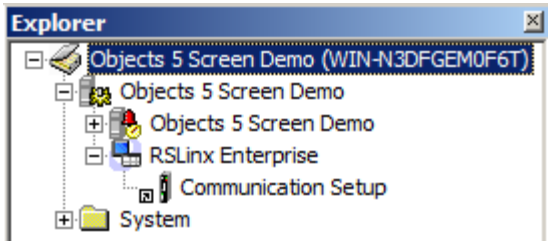
You can create additional OPC data servers for your application. For example, you might want to use an RSLinx Enterprise data server and a KEPServer Enterprise data server to communicate with a third party device.

Set up RSLinx Enterprise data servers

You can use the **Communication Setup** editor to add drivers, add devices, set up driver and device properties, and set up device shortcuts.

To set up communications in RSLinx Enterprise

1. In the **Explorer** window, open the RSLinx Enterprise data server.



2. Double-click the **Communication Setup** editor.

3. In a new application, the RSLinx Enterprise Configuration Wizard opens. Follow the instructions to create a new configuration or use an existing device configuration. Once you make a choice and click **Finish**, the **Communication Setup** editor opens.

In an existing application, double-clicking **Communication Setup** opens the **Communication Setup** editor, with its two tabs.

The **Design (Local)** tab is for establishing the location of the tags/addresses for editing. The tags/addresses can be online with a controller or other data server, or an offline controller file. This will enable the **Tag Browser** to find the tags/addresses.

The **Runtime (Target)** tab is for identifying the connection from the runtime computer or terminal to the controller or other data server. If the paths are the

same, use the **Copy** button to copy the Design configuration to the **Runtime** tab.

For more information, see Help for RSLinx Enterprise.

Set up an OPC data server

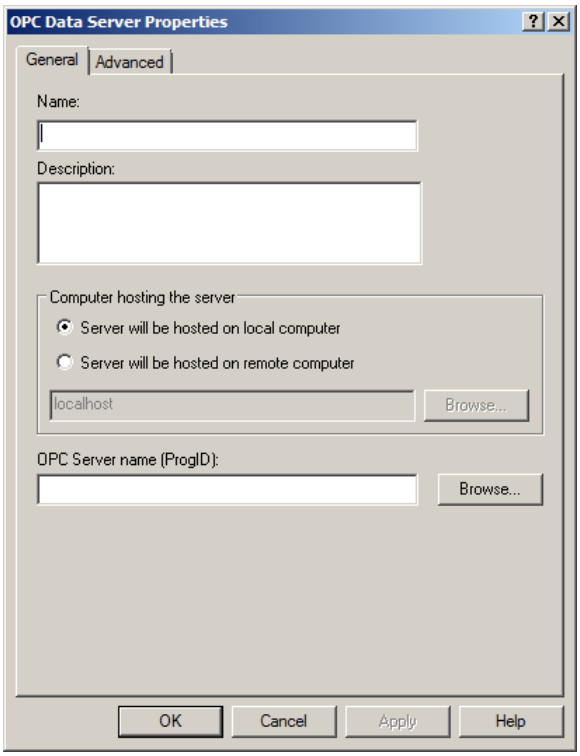
Use a KEPServer Enterprise data server if you need to connect third party devices.

Use RSLinx Classic data server if you have one of the situations described above and you are using a personal computer in your application.

If you need to view or use tag names when you are not connected to a device, you can setup a cache that will read in tag names from the device and enable them to be used when the device is offline.

To create an OPC data server

- In the Explorer window, right-click the application, select **Add New Server**, and then click **OPC Data Server**.



For details about selecting options in the **OPC Data Server Properties** dialog box, see FactoryTalk View Machine Edition Help.

Update data server caches

If tags are added, modified, or deleted on the data server, you must update (synchronize) the cache manually.

For information about updating the data server cache periodically after you create it, see FactoryTalk View Machine Edition Help.

For information about editing and removing data servers, see FactoryTalk View Machine Edition Help.

Steps for transferring applications to a PanelView Plus terminal

Follow these steps to:

- Install hardware and software on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal.
- Transfer your application to the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal.

For information about installing FactoryTalk View ME Station, see the *FactoryTalk View Machine Edition Installation Guide*.

To set up communications

1. Gather information about your network, and the devices that are connected to it. You will need this information to set up RSLinx Enterprise, KEPServer Enterprise, RSLinx Classic, or another OPC server. Do one of the following:

   - If you want to use KEPServer Enterprise as the OPC server that enables communications on your network, set up KEPServer Enterprise on the development computer. For details, see KEPServer Enterprise Help.
   - If you want to use RSLinx Classic as the OPC server that enables communications on your network, set up RSLinx Classic on the development computer. RSLinx Classic is included on the FactoryTalk View installation DVD. For details, see Getting Results with RSLinx, or see Help for RSLinx.

     RSLinx Classic is available for FactoryTalk View ME Station on personal computers only.
   - If you want to use an OPC server other than RSLinx Classic for communications on your network, set up the OPC server on the development computer. For details, see the documentation supplied with your OPC server.

2. In FactoryTalk View Studio, create a data server that points to the OPC server you have installed.

If you are using RSLinx Enterprise for communications, you don't need to create a data server because it is created automatically when you create your FactoryTalk Machine Edition application.

Note: KEPServer Enterprise is the only OPC Server supported on PanelView Plus terminals

3. If you want to use HMI tags in your application, open the **Tags** editor, and then create device tags that point to addresses in devices. For details about creating HMI tags, see Use HMI tags on page 97.

   If you do not want to use HMI tags, but instead want to reference addresses in devices directly, skip this step.

   Best practice is to use direct reference tags.

4. In objects in graphic displays, or anywhere else you want access to values in tags, type the tag name using the syntax for your OPC server, or use the **Tag Browser** to select tags. For details about using tags, see Work with tags on page 85.

5. Create the runtime application file. For details, see Create runtime applications on page 221.

   All the necessary tag information is compiled with the runtime application file.

6. If you are using an OPC server other than RSLinx Enterprise or RSLinx Classic, install the OPC server software on the runtime computer.

   For applications that will run on a personal computer, the OPC server can be on a different (remote) computer than the runtime computer, but the remote computer must be on the same network as the runtime computer.

Work with tags

This chapter provides general information about working with all kinds of tags. This chapter describes:

- Types of tags
- When to use data server tags
- Steps for using data server tags
- When to use HMI tags
- Steps for using HMI tags
- Browse for tags and offline tags
- Use the **Tag Browser**
- Use tags and expressions in your application
- Log tag values
- Use macros to assign values to tags

For information about creating HMI tags, see Use HMI tags on page 97.

Types of tags

A tag is a logical name for a variable in a device or in local memory (RAM). For example, a tag can represent a process variable in a programmable controller.

Data server tags

FactoryTalk View conforms to the OPC DA (Data Access) 2.05a specification for information exchange among automation or control applications, field systems or devices, and business or office applications.

In FactoryTalk View, data servers such as RSLinx Enterprise, RSLinx Classic, and KEPServer Enterprise provide access to OPC-DA-compliant tags. In the FactoryTalk View documentation, the tags you use through a data server are called data server tags. For more information about data servers, see Set up communications on page 79.

Data server tags include tags found in Logix5000 processors and tags from other OPC-compliant devices. You use data server tags by providing a direct reference to the tag's location, wherever you want your application to use the data.

HMI tags

In addition to direct referencing tags from data servers, FactoryTalk View allows you to create tags with additional properties such as minimum and maximum values, scale, and offset. These tags can reference values at an external data source, or store values in the runtime computer's memory. Tags you create in FactoryTalk View are called HMI tags.

The data source

The FactoryTalk View documentation uses the term data source as a generic term that includes all possible sources of tag data, for both data server tags and HMI tags. The data source can be memory or a device such as a programmable controller or an OPC server. FactoryTalk View writes values to and reads values from the data source. The data source is set up to exchange information (in the form of numeric or string values) between the FactoryTalk View value table and the machine that your application is controlling.

Basic steps for using tags

To use tags, follow these basic steps:

1. If the tag does not already exist, create the tag.

   - To use a data server tag, you can use an existing tag in the processor (for example, a programmable controller), or you can create a new one in the processor or OPC server. For example, in a Logix5000 processor, you could create the tag using your RSLogix 5000, or Logix Designer programming software.
   - To use an HMI tag, you must first create it in the **Tags** editor. For details, see Use HMI tags on page 97.

2. Browse for, or type, the name of the tag anywhere you want to connect an object to data at run time.

   For example, to make a push button change a tag value when it is pressed, connect the push button to a tag by typing the tag name in the **Connections** tab of the push button's **Properties** dialog box.

If you don't know the names of tags, you can browse for them. You can browse while online and connected to a device, or you can browse for tags from an offline file, for example a Logix5000 program file. To browse for tags, use the **Tag Browser**. For details, see Browse for tags on page 89.

Use tag names that don't exist

You can type the name of a tag that does not exist. If you do this, ensure that you spell every instance of the tag name consistently, and that when you do create the tag, you spell it the same way you did when you referred to it.

When to use data server tags

For some of the things you want to do in your application, you might not need to create HMI tags. Use direct references to tags located in devices instead, for example, tags located in an OPC server's database.

Eliminate duplication

Using data server tags allows you to add, modify, or delete tags in a device without having to duplicate the changes in the FactoryTalk View HMI tag database.

Use complex data

Some devices, for example Logix5000 processors, support complex data types such as arrays and structures. Your controller might have structures that contain hundreds of member elements.

Referencing tag values directly eliminates the need for creating an HMI tag for each member.

Direct reference tags usually update faster than HMI tags. To obtain the best system performance for your application, use direct reference tags where possible.

Steps for using data server tags

To use data server tags, complete three basic steps:

1. Create the tag in the OPC server or processor, or use an existing tag in the processor.

   The server must understand the syntax of the device it is connected to. You need only create a tag if you want to browse the server.

   Examples of OPC servers include RSLinx Enterprise, RSLinx Classic, and KEPServer Enterprise. For information about creating tags in OPC servers that have their own tag database, see the documentation provided with the server.

   For information about creating tags in a Logix5000 processor, see the documentation for your device programming software.

2. Create a data server in FactoryTalk View, if your application does not already have one. Every new FactoryTalk View Machine application includes a RSLinx Enterprise data server automatically.

   For more information, see Set up communications on page 79.

3. In graphic displays, data log models, or anywhere else you want to use a tag's value, create a direct reference to the tag. At run time, the tag's value is passed to the graphic display or data log model.

When to use HMI tags

Use HMI tags to manipulate tag data and to store tag values in the runtime computer's memory.

Scale, offset, or provide a range for data

Use HMI tags if the data server you are using does not provide for:

- Scale or offset a value.
- Set minimum or maximum limits on a value (that is, providing a range of values).

Scale and offset

The scale and offset modify the *raw data* that comes from and goes to the programmable controller before the data is saved in the computer's memory (called the *value table*). The scale and offset also modify the value specified in FactoryTalk View before it is written to the programmable controller.

The scale is a multiplication factor — the value from the programmable controller is multiplied by the scale.

The offset is a fixed value — after the value from the programmable controller is multiplied by the scale, the offset amount is added.

Minimum and maximum

HMI tags allow you to set a minimum and maximum value that can be written to the programmable controller or server.

These values do not affect what is read from the programmable controller or server.

For example, if you specify a minimum of 0 and a maximum of 100, FactoryTalk View would be able to read a value of 200 from a programmable controller and store it in the value table, but would not be able to write this value to the programmable controller.

For more information about minimum and maximum, and scale and offset, see Help.

Store values in FactoryTalk View memory

A memory tag can be used to store values without the need for an attached or accessible device.

For example, you might need to store a value in memory:

- To store the result of a calculation.
- Temporarily, for example, a counter or index.
- To maintain information about the system's current state, for example which graphic display was last opened.

For information about creating HMI memory tags, see Use HMI tags on page 97.

Steps for using HMI tags

To use HMI tags, complete two basic steps:

1. In the **Tags** editor in FactoryTalk View, create a tag. HMI tags can be used as an internal storage location. Optionally you can map the tag name to an OPC tag or device address.
2. For more information, see Use HMI tags on page 97.
3. In graphic displays, alarm triggers, or anywhere else you want to use a tag's value, assign the tag. At run time, the tag's value is passed to the graphic display or alarm system.

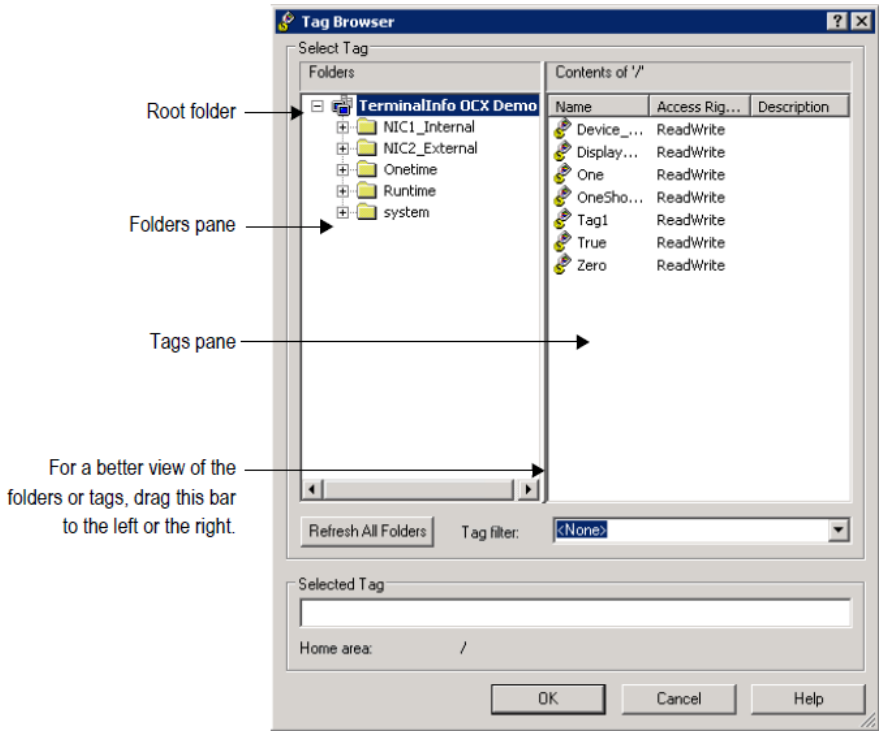
Browse for tags

You don't have to remember the path and name of a tag to use it in your application. Whenever you need to use a tag, you can open the **Tag Browser** and select the tag to use.

To open the Tag Browser

- In most editors, click the **Browse** button in the **Tags** column.
- In the **Expression** editor, position the cursor where you want to insert a tag name, and then click **Tags**.
- In the **Parameters** editor, double-click where you want to insert a tag name.

Use the Tag Browser



In the **Tag Browser**, you can:

- Select a single tag or multiple tags. The ability to select multiple tags is available in the **Data Log Models** editor only. In the illustration above, only a single tag can be selected.
- Select data server tags and HMI tags.
- Select a folder of tags without selecting a specific tag in the folder. This is useful for applications that use controller instruction faceplates. It is also useful when you use global object parameters. Folders of tags are also known as backing tags or structured tags. For information about global object parameters and controller instruction faceplates, see Use parameters and global objects on page 501.

  You cannot select backing tags when you open the **Tag Browser** from the **Data Log Models** editor.
- Create and edit HMI tags.
- Create new folders for HMI tags.
- Import tags from a PLC or SLC™ database.

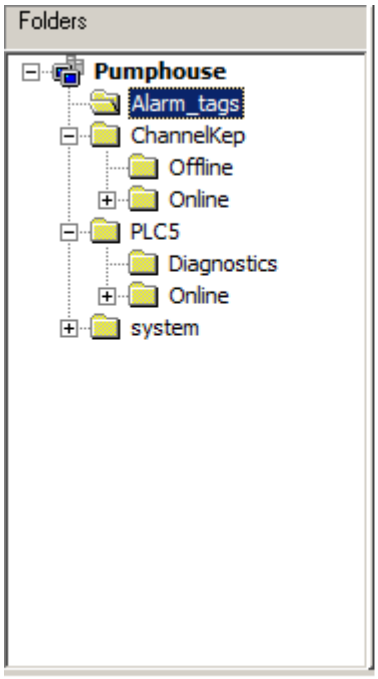
For more information about using the **Tag Browser**, see Help.

Show server names

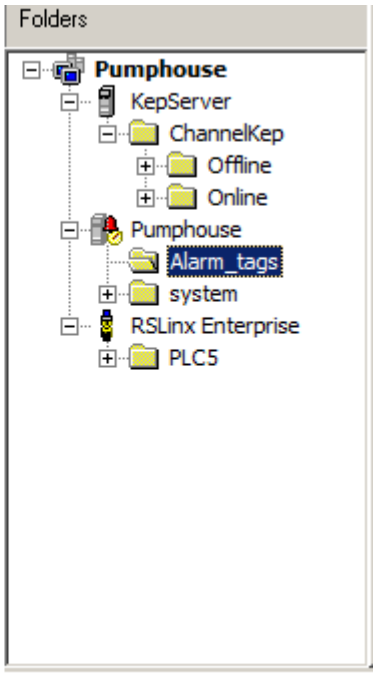
By default, the Folders pane in the **Tag Browser** shows folders, but not the servers they belong to. You can show the names of servers that have been set up in the application.

To show server names

- Right-click a blank area of the Folders pane and then select **Show Server Names**.



The folders list with server names hidden.



The folders list with server names shown.

In the example on the left, folders are listed alphabetically by name.

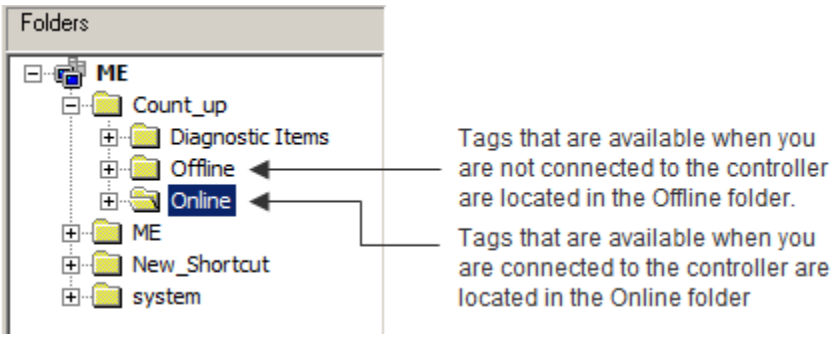
In the example on the right, there are two data servers, named KEPServer and RSLinxServer. Folders of data server tags are listed under the data server, to which they belong. Below the data servers, the application is listed as an HMI server, with folders of HMI tags under the application name.

Browse for off-line tags

For each RSLinx Enterprise device shortcut, or each RSLinx Classic OPC topic in your application, an Offline and an Online folder is shown in the **Tag Browser**.

In RSLinx Enterprise, you can use the Offline folder to browse tags in an RSLogix 5000 RSLogix.acd file. For details about making the .acd file available to browse offline, see RSLinx Enterprise Help.

In RSLinx Classic, you can use the Offline folder to browse tags in a PLC program stored on disk. If the OPC topic in RSLinx Classic has access to symbols, you can browse for them in the Offline folder. For details about adding symbols to the OPC topic in RSLinx Classic, see RSLinx Classic Help.


Folders
ME
Count_up
Diagnostic Items
Offline
Online
ME
New_Shortcut
system
Tags that are available when you are not connected to the controller are located in the Offline folder.
Tags that are available when you are connected to the controller are located in the Online folder

Use tags and expressions in your application

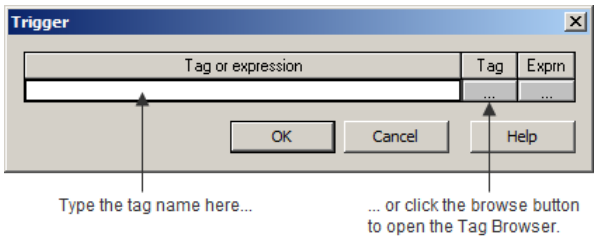
Once you have created tags (either in data servers or in FactoryTalk View), assign them to connections in your application to allow the application to interact with the data source and perform actions based on the tag values.

You can assign tags in these editors:

- **Expressions**
- **Global Connections**
- **Graphic Displays**
- **Global Object Displays**
- **Graphic Libraries**
- **Parameters**
- **Alarm Setup**
- **Information Setup**
- **Macros**
- **Data Log Models**
- **RecipePlus Editor**

Assign tags

This example shows the **Trigger** dialog box that opens when you click the **Add** button in the **Triggers** tab of the **Alarm Setup** editor:



To assign a tag, do one of the following:

- In the **Tag or expression** column, type the tag name.
- In the **Tag** column

, click the **Browse** button and then select a tag from the **Tag Browser**.

For information about using the **Tag Browser**, see Help.

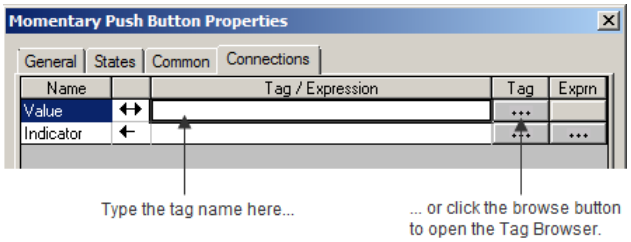
Assign tags to graphic objects

In the **Graphics** editor, you can assign tags to many of the graphic objects you create.

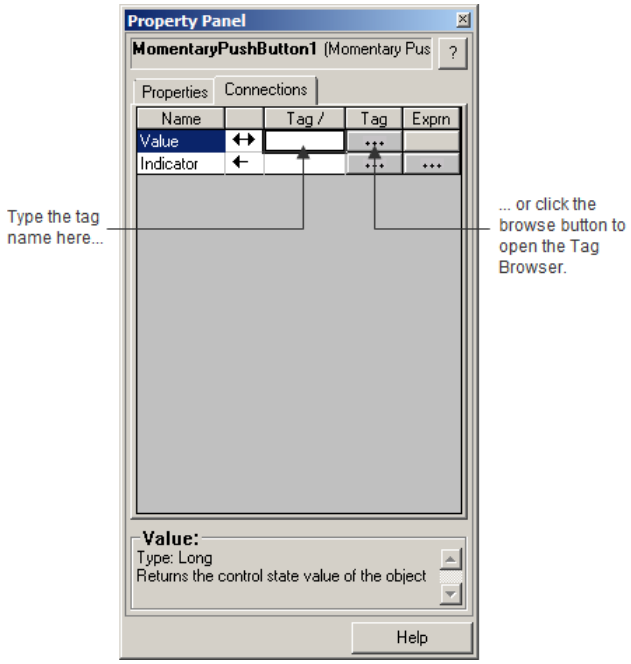
You can use up to 1,000 tags per graphic display. This limit includes the tags contained in embedded variables and expressions. For example, if an expression references the same tag twice, this counts as two tag references.

To assign tags to a graphic object, use one of these methods:

- Double-click the object to open the object's **Properties** dialog box, and then click the **Connections** tab.



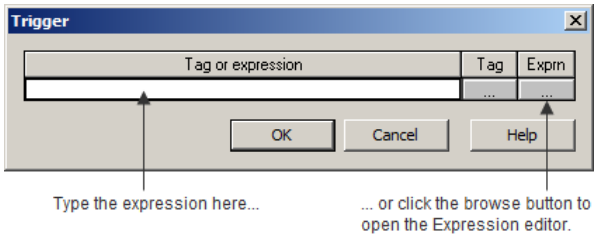
- Select the object, and then assign tags in the **Connections** tab of the **Property Panel**.



Use expressions to manipulate tag values

Many of the connections to which you can assign a tag also permit the use of expressions to perform logical or mathematical calculations on tag values. If you assign an expression, FactoryTalk View monitors the expression value rather than the original tag value. For example, your machine might send values to the data source in the form of temperature in degrees Celsius. You could use an expression to convert the value to degrees Fahrenheit, and then monitor the expression result rather than the original tag value.

If you can assign an expression, a **Browse** button is present in the **Exprn** column in the **Connections** tab.



To assign an expression, do one of the following

- In the **Exprn** column, click the **Browse** button, and then create an expression in the Expression editor. Use this method if you want to check the expression syntax.

- In the **Tag or expression** column, type the expression. The expression syntax is not checked if you use this method.

For more information about expressions, see Use expressions on page 475.

Substitute tag names used in graphic objects

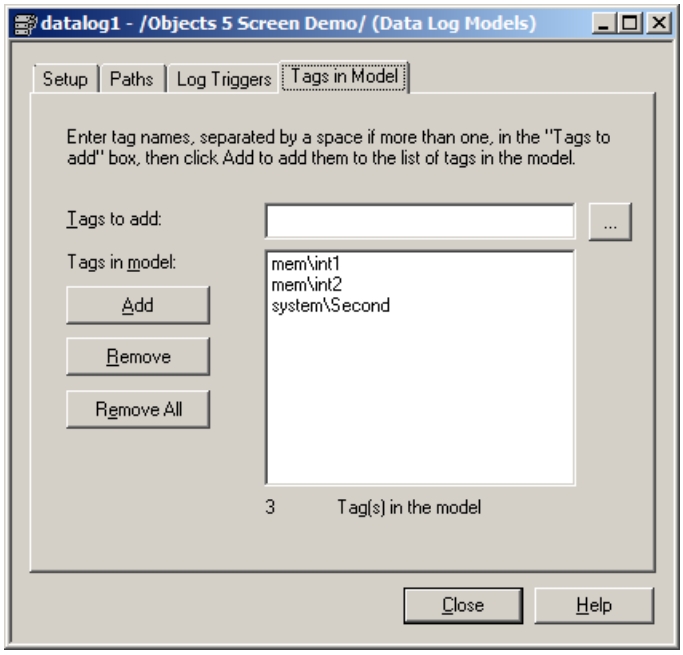
You can use tag substitution or Find and Replace to replace tag names and expressions assigned to the connections for graphic objects. For example, if you assign a tag to multiple objects in a graphic display, and then decide to use a different name for the tag, you can create a new tag and then use tag substitution or Find and Replace to search for all tag references with the old name, and replace them with the new tag name.

You can also use tag substitution to replace the tags contained in embedded variables.

For more information about tag substitution and Find and Replace, see Replace tags using tag substitution on page 368.

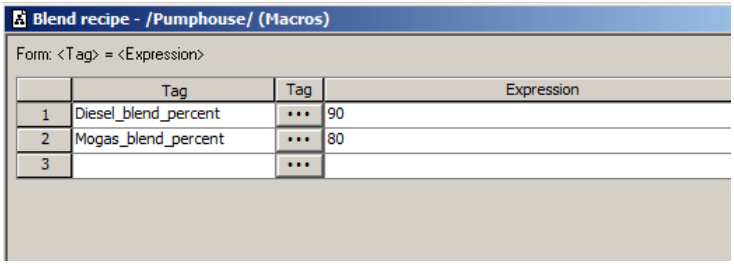
Log tag values

Analog and digital tag values can be logged, including both HMI and data server tags. To set up data logging, use the **Data Log Models** editor. For more information, see Set up data logging on page 519.



Use macros to assign values to tags

A macro is a list of tag assignments stored in a text file. Whenever you run the macro, the specified values are written to the tags. For more information about macros, see Use macros on page 561.



You can also use recipes to assign values to multiple tags with a button press. For information about using recipes to assign values to tags, see Set up RecipePlus on page 547.

Use HMI tags

This chapter describes:

- HMI tag types
- Use the **Tags** editor
- Data sources
- Address syntax for device tags
- Organize HMI tags
- View tag statistics
- Other methods for creating HMI tags
- Import HMI tags

HMI tag types

HMI tags are tags you create in FactoryTalk View. For information about when to use HMI tags versus when to use data server tags, see Work with tags on page 85.

You can create and use these types of HMI tags in FactoryTalk View:

This tag type	Stores this type of data
Analog	Range of values. Use analog tags to represent variable states such as temperature or the position of rotary controls.
Digital	0 or 1. Use digital tags to represent devices that can only be on or off, such as switches, contacts, and relays.
String	ASCII string, series of characters, or whole words (maximum of 82 characters). Use string tags to represent devices that use text, such as a bar code scanner that uses an alphanumeric product code.
System	Information generated while the system is running, such as the name of the logged-in user, system time and date, and so on. FactoryTalk View creates system tags when you create an application. The system tags are stored in the folder called "system" in the HMI tag database. You cannot edit system tags. You can use system tags anywhere you would use any other type of tag. For a list of system tags, see System tags on page 593.

Analog tags that use floating-point values

You can assign analog tags to most of the connections in FactoryTalk View, including both HMI and data server tags. If the analog tag uses a floating-point data type but an integer value is required, the floating-point value is rounded.

For information about the data types available for analog tags, see Help.

How values are rounded

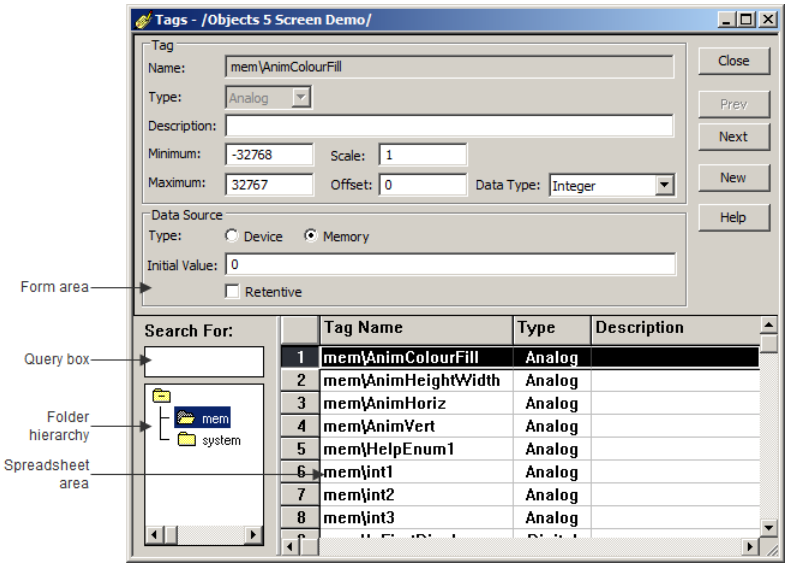
When a floating-point value must be rounded to an integer, this is how the value is rounded:

- If the number after the decimal is 4 or less, the value is rounded down. For example, 8.495 is rounded to 8.
- If the number after the decimal is 6 or more, the value is rounded up. For example, 8.6 is rounded to 9.
- If the number after the decimal is 5, the value is rounded using a "banker's algorithm," to average out the rounding over time:
  - If the number before the decimal is 0, the value is rounded down. For example, 10.5 is rounded to 10.
  - If the number before the decimal is an odd number, the value is rounded up. For example, 11.5 is rounded to 12.
  - If the number before the decimal is an even number, the value is rounded down. For example, 12.5 is rounded to 12.
  - Floating point values are rounded to a maximum of six digits. Therefore, using a floating-point data type and adding to it a value that exceeds the six significant digits will result in a rounding error. For example, adding any number to 999,999 will result in a rounding error.

This rounding method is also used for Numeric Input Enable buttons that use the implicit decimal position, if an integer tag is assigned to the button's **Value** connection. For more information about the Numeric Input Enable button, see Set up Numeric Input Enable buttons on page 418.

Use the Tags editor

The **Tags** editor has these parts: form area, query box, folder hierarchy, and spreadsheet area.



The information you enter in the form area is shown in the spreadsheet area. The folder hierarchy shows all the folders that you and FactoryTalk View create.

The **Tags** editor has special items on the View menu to control the appearance of the editor, and extra tools on the toolbar.

Use the **Tags** editor to:

- Create folders
- Duplicate, nest, and delete folders
- Create and view tags
- Edit, duplicate, and delete tags

For details about using the **Tags** editor, see Help.

Update the contents of the Tags editor

You can create tags in the **Tags** editor, but you can also create them as you work in other editors, and you can import them from an existing tag database. To see the result of changes to the database you make in other editors while the **Tags** editor is open, update the contents.

To update the contents of the editor

- From the **View** menu, select **Refresh**, or click the **Refresh** tool.

When you select **Refresh**, the undo buffer is cleared and recent changes can't be automatically reversed.

Refresh is not available if you haven't accepted the current tag.

For information about creating tags in other editors, see Other methods for creating HMI tags on page 105.

Search for HMI tags

Use the **Tags** editor's query box to select the tags you want to show in the spreadsheet. This allows you to edit tags in different folders without browsing the folder hierarchy. You can:

- Select a single tag by typing the tag name.
- Select multiple tags by typing wildcard characters.

These are the wildcard characters:

This character	Does this
?	Matches any single character.
*	Matches any number of characters, including the backslash (\) character. Use this wildcard character by itself to show all the tags in the HMI tag database.

For example, to search for all the tags that contain the string "pump" in their name, type *pump* in the **Search For** box. When you press **Enter**, a list of tags containing the string "pump" appears in the spreadsheet.

When you do searches, remember that the backslash in a folder name counts as a character in the tag name.

You can also use **Find** to search for every occurrence of a specific tag or text string throughout different components within FactoryTalk View ME applications. Find also locates all the text strings within each component that refer to the tag.

To find a tag or text string

1. From the tool bar, click , or from the **Tools** menu, select **Find**.
2. Type the text string in Find what, or identify the tag to search for:

- Click the browse button (…) next to **Find what**.
- From the **Tag Browser**, navigate to the correct folder in the left pane, and then select the tag in the right pane then click **OK** to save the selection and close the browser.

3. If needed, identify the type of product components to search in **Find within** (all components are selected by default):

   - Click the browse button next to **Find within**.
   - From the **Find within** dialog box, select the product component types to be searched then click **OK** to save the selection and close the dialog box.

4. Identify the word search limitations in **Find Options**.

5. Select the **Direction** in which to search:

   - Select **Up** to search for the tag or text string in all components before the open one.
   - Select **Down** to search for the tag or text string in all components after the open one.

6. Click **Find Next**. The location of the found tag or text string is shown in **Found item**. Click **Find Next** again to find each item in the search order. You can click the found item to open it in the appropriate editor.

7. If needed, click **Find All** view a spreadsheet of all items that match your search criteria. Double click the found item in the spreadsheet to open it.

To find all references to a tag or a text string

1. From the tool bar, click or select **Cross Reference** from the **Tools** Menu.

2. Type the text string in Find what, or identify the tag to search for:

   - Click the browse button (…) next to **Find what**.
   - From the **Tag Browser**, navigate to the correct folder in the left pane, and then select the tag in the right pane then click **OK** to save the selection and close the browser.

3. If needed, identify the type of product components to search in Find within (all components are selected by default):

- Click the browse button next to **Find within**.
- From the **Find within** dialog box, select the product component types to be searched then click **OK** to save the selection and close the dialog box.

4. Click **Search** to show all the found items in a spreadsheet form. 4.
5. You can double click any of the found items to open it with the appropriate editor.

Data sources

When creating an HMI tag, you must specify a data source. The data source determines whether the tag receives its values externally or internally.

The data source

The FactoryTalk View documentation uses the term data source as a generic term that includes all possible sources of tag data, for both data server tags and HMI tags. The data source can be memory or a device such as a programmable controller or an OPC server. FactoryTalk View writes values to and reads values from the data source. The data source is set up to exchange information (in the form of numeric or string values) between the FactoryTalk View value table and the machine that your application is controlling.

Device

A tag with device as its data source receives its data from a source external to FactoryTalk View. The data can come from a programmable controller or other device via RSLinx Enterprise, or from another OPC server. You can use up to 5,000 device tags.

For analog tags with Device as the data source, the data type determines the format used when reading and writing tag data to the data server.

Do not create HMI Tags that are pointing to a System Tag. When a project contains an HMI tag pointing to a System Tag, users may fail in creating an MER or have runtime performance issues.

Memory

A tag with memory as its data source receives its data from (and stores values in) the FactoryTalk View internal value table. Tags with memory as the data source do not count toward the total tag limit.

For analog tags with Memory as the data source, select the data type that matches the format of the data you will store in the tag. Choosing **Default** is the same as choosing **Floating Point**.

Address syntax for device tags

For device tags, you must provide the address and path to the OPC server that is connected to the data source. For example, the OPC server could be connected to a device such as a programmable controller.

The syntax for OPC tag addresses is:

```
[AccessPath]Address
```

or

```
::[AccessPath]Address
```

where :: indicates that the address resides in a data server in the application. (The two colons are necessary when the address contains a colon, for example, N7:0.)

The square brackets are part of the syntax. They do not indicate optional parameters.

The access path is one of the following:

- For communications with an RSLinx Enterprise data server, the access path is the name of the device shortcut in RSLinx Enterprise.
- For communications with an RSLinx Classic OPC server, the access path is the name of an OPC topic in RSLinx Classic.
- For communications with other OPC servers, the access path might be optional. For information about the syntax for the access path, see your OPC server documentation.

Example: Logix5000 addressing

We recommend that you use the **Tag Browser** or Find and Replace to select OPC items. When you use the **Tag Browser** the correct syntax and data types are selected automatically.

However, if you want to define tags before setting up communications, you can type the address manually, as shown in this example. If you type the address manually, be sure to select the data type for the tag that matches the data type used by the Logix5000 processor. If you use the Default data type, values are treated as floating-point values.

This example shows you how to specify the OPC topic, item name, and bit level of an item that uses the integer data type in a Logix5000 processor.

OPC topic and item addressing

Logix5000 uses this addressing syntax:

[*Device shortcut*]*item name* for RSLinx Enterprise.

[*OPC topic name*]*item name* for RSLinx Classic.

In this example, the RSLinx Enterprise device shortcut name for the Logix5000 processor is CLGX. To connect to an OPC item called Motor, type this address:

```
[CLGX]Motor
```

Bit level addressing

You can gain access to the bit level of an item that uses the integer data type by appending .# to the end of the tag address, where # is the number of the bit you want access to.

For example, to gain access to the first bit of the integer item Motor, type this address:

[CLGX]Motor.0

Organize HMI tags

Organize tags makes finding and using tags faster and simpler. To organize your tags, try these tips:

- Establish naming conventions.

  Naming conventions enable you to use wildcard characters most effectively when searching for and showing tags during development.

- Use folders to group related tags.

Name tags

Tag names can be up to 255 characters long including folder name. If you create a folder, the folder name becomes part of the tag name. The backslash (\) after a folder name counts as a character.

The tag name can contain these characters:

- A to Z
- 0 to 9
- underscore (_) and dash (-)

Tag names cannot contain spaces. The tag name can be mixed case. Tag names preserve upper and lower case for readability but are not case

sensitive. For example, the tag name MixerValve1 is the same as mixervalve1.

When a tag name starts with a number or contains a dash, enclose the name in curly brackets { } when you use it in an expression, for example, {N33-0}. For more information about using tags in expressions, see Use expressions on page 475.

Use folders to group tags

To organize tags, create a folder to store tags that are related to one another. To separate the folder name from the rest of the tag name, use a backslash (\). For example, tags in the folder called Pump would start with Pump\.

For greater organization, you can nest folders. For example, you can organize the HMI tag database first by area, then by machines in the area, and finally by devices in each machine. The result might be Area1\Machine1\Pump.

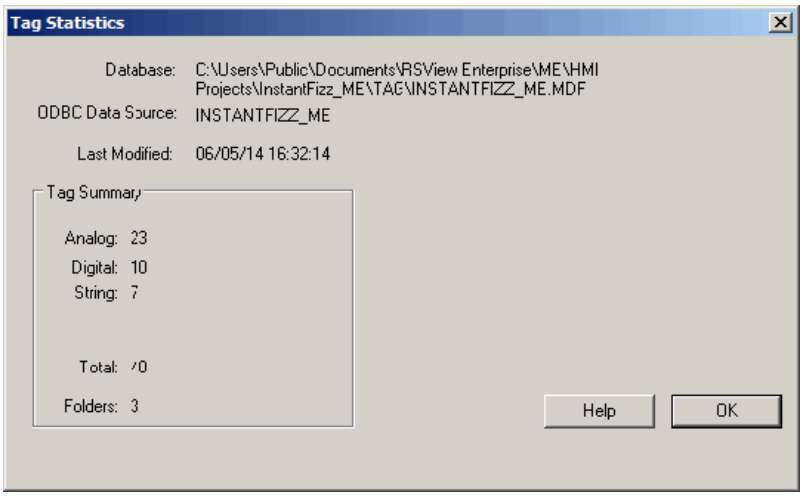
To create similar groups of tags quickly, create one folder with its tags and then duplicate the folder.

View tag statistics

The **Tag Statistics** dialog box provides a summary of how many tags your application uses, as well as other tag information such as the date the HMI tag database was last modified. To view tag statistics, the **Tags** editor must be open and have focus.

To view tag statistics

- From the **View** menu, select **Tag Statistics**.



Other methods for creating HMI tags

In addition to creating tags in the **Tags** editor, you can:

- Create tags as needed in other editors (using the **Tag Browser**).
- Import tags from a PLC or SLC database. For details see Import tags from a PLC database on page 107.

Create tags as needed in other FactoryTalk View editors

You can create tags as needed in any editor or dialog box that uses tags. You can add a tag to the database by doing one of the following:

- Click the **Browse** button in the **Tag** column

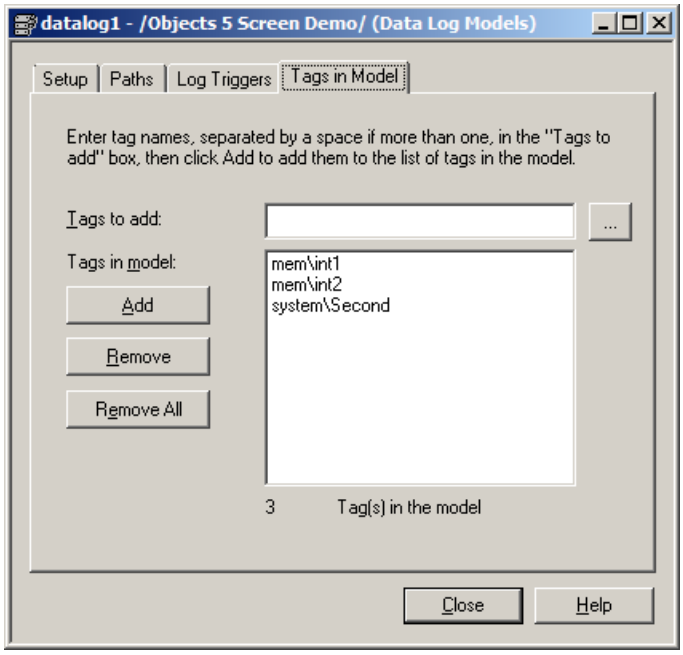
to open the **Tag Browser** and create the tag. For information about using the **Tag Browser**, see Browse for tags on page 89.
- Type a new tag name in the **Tag or expression** column. Keep track of the tag name, and add the tag in the **Tags** editor when convenient.

Create tags as needed in the Data Log Models editor

In the **Data Log Models** editor, in the **Tags in Model** tab, you can add a tag to the database by doing one of the following:

- Click the **Browse** button beside the **Tags to add** box to open the **Tag Browser** and create the tag. For information about using the **Tag Browser**, see Browse for tags on page 89.
- Type a new tag name in the **Tags to add** box, and then click **Add**. You are warned that the tag does not exist. Click **Yes** to add the tag to the list of tags in the datalog model. Keep track of the tag name, and add the tag in the **Tags** editor when convenient.

For more information about the **Data Log Models** editor, see Set up data logging on page 519.



Import tags from a PLC database

Use the **Import PLC Tags** dialog box to selectively import tags from a PLC or other database into your application's HMI tag database. Tags imported in this way are copied into the database. They are not shared with the source database. This means changes to tags in your application do not affect the database from which they have been imported, and vice versa.

You can import tags from any of these databases:

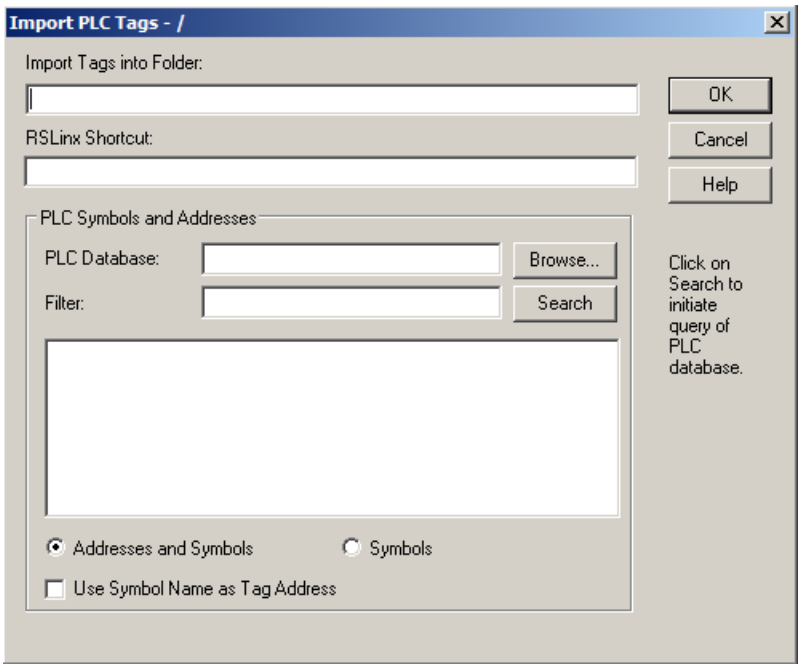
- RSLogix 500 internal database, with file extension .rss
- RSLogix 5 internal database, with file extension .rsp
- RSLogix 5 or RSLogix 500, saved as an external database, with file extension .ctd (before importing, explicitly export to the .ctd format to be sure of including the latest changes)

For PLC and SLC addresses, the **Import PLC Tags** dialog box shows only addresses that are used in the symbol or address list of the PLC programming software.

To open the Import PLC Tags dialog box, do one of the following

- In the **Tag Browser**, right-click the right pane, and then select **Import PLC Tags**. For information about using the **Tag Browser**, see Browse for tags on page 89.

- In the **Tags** editor, from the **Edit** menu select **Other Databases**, or click the **DB Browser tool** .



For more information about using the **Import PLC Tags** dialog box, see Help.

Use the Tag Import and Export Wizard

You can also import PLC or SLC databases into FactoryTalk View using the Tag Import and Export Wizard.

You can use the wizard to:

- Export your application's tags to a .csv file.
- Import tags from another FactoryTalk View application's tag .csv file.
- Merge tags from another FactoryTalk View application (that is, import them directly from the application, without first creating a tag .csv file).
- Import tags from RSLogix 5 or RSLogix 500, saved as an external database, with file extension .ctd (before importing, explicitly export to the .ctd format to be sure of including the latest changes).

To start the wizard, do one of the following

- In FactoryTalk View Studio, from the **Tools** menu, select **Tag Import and Export Wizard**.

- From the **Windows Start** menu, select **Programs> Rockwell Software> FactoryTalk View> Tools> Tag Import and Export Wizard**.

For details about using the wizard, see the wizard's Help.

Set up global connections

This chapter describes:

- What global connections are
- Update the date and time
- Change displays
- Control display changes remotely
- Use parameter files or parameter lists with display changes
- Close On Top displays
- Print displays
- Run macros
- Set up the backlight intensity remotely
- Monitor runtime RAM usage

About global connections

Global connections are connections that apply to your entire runtime application. Global connections allow the data source to control or interact with your application at run time.

You can use global connections to:

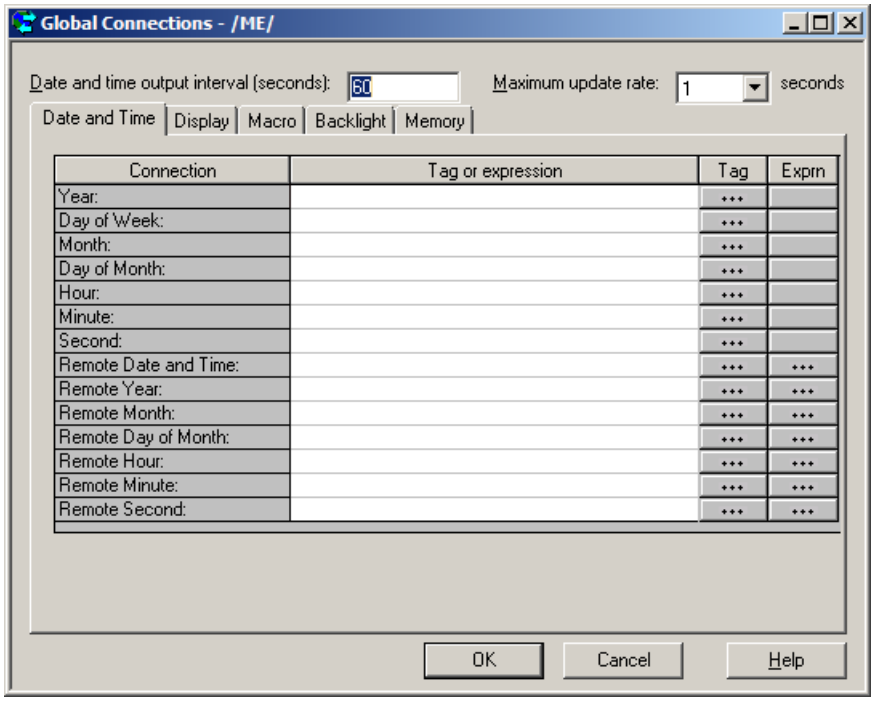
- Update the date and time at the data source using the runtime terminal's date and time.
- Update the date and time on the runtime terminal using the data source date and time.
- Notify the data source of the current display number.
- Notify the data source when a display is printed.
- Change the display on the runtime terminal remotely (from the data source).
- Close On Top displays
- Apply parameter files or parameter lists to the tag placeholders in the changed displays.
- Print the current display from the data source.
- Run up to five macros from the data source, when a tag or expression result changes.

- Set the intensity of the backlight on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal.
- Monitor runtime RAM usage for troubleshooting purposes.

The use of each global connection is optional.

Set up global connections

Use the **Global Connections** editor to set up global connections.



For detailed information about the options in the **Global Connections** editor, see Help.

Update the date and time

Use the date and time connections in the **Date and Time** tab of the **Global Connections** editor to update the date and time. You can assign any or all of the date and time connections, or leave them unassigned.

Normally you would assign only one set of date and time connections, either to update the date and time at the data source from the terminal, or to update the terminal's internal clock from the data source.

The values of assigned date and time connections are updated in the order, in which the connections are listed in the **Global Connections** editor.

Update the date and time at the data source from the terminal

To update the date or time at the data source from the terminal's internal clock, assign a tag to one or more of these connections:

This connection	Contains this range of values
Year	00-99
Day of Week	1-7, with 1 being Sunday
Month	1-12
Day of Month	1-31
Hour	0-23
Minute	0-59
Second	0-59

Specify how frequently to update the values of the assigned connections at the data source (from the terminal's internal clock) by typing a time in the **Date and time output interval** box.

Update the date and time at the terminal from the data source

This option is especially useful if you have several terminals connected to the same data source. Instead of the operator resetting the date and time manually on each terminal, the data source can reset all internal clocks at once.

To update the date or time in the terminal's internal clock from the data source, assign a tag or an expression to the Remote Date and Time connection. Also assign a tag or an expression to one or more of these connections:

This connection	Contains this range of values
Remote Year	00-99 or 0000-9999
Remote Month	1-12
Remote Day of Month	1-31
Remote Hour	0-23
Remote Minute	0-59
Remote Second	0-59

When the Remote Date and Time connection value changes to a new non-zero value, the terminal resets its internal time and date to the time and date read from the individual remote date and time connections.

The date and time are updated at the rate specified in the **Maximum update rate** box, but changes are not made until the Remote Date and Time connection changes to a new non-zero value.

Change displays

Use these global connections in the **Display** tab of the **Global Connections** editor to monitor and control display changes:

- **Replace Display Number** — notifies the data source of the number of the Replace display that's currently open.
- **Remote Display Number** — allows the data source to change the display on the runtime computer.

Control display changes remotely

To control display changes remotely, you can set up the data source to open graphic displays using global connections.

Global connections are connections that apply to your entire runtime application. Global connections allow the data source to control or interact with your application at run time.

For example, the **Remote Display Number** connection is a global connection that you can use to control display changes from the data source. You can also use global connections to apply parameters to the displays that are opened from the data source, to close one or more On Top displays from the data source, to print graphic displays from the data source, to run macros from the data source, to control the date and time displayed on the runtime terminal, to set the intensity of PanelView backlights, and to monitor runtime RAM usage. For more information about global connections, see Set up global connections on page 111.

Remote display changes and security

If you set up the data source to open graphic displays remotely, remote display changes occur whether or not the logged-in user has security access to a given display.

Set up remote display changes

This section outlines the steps for setting up remote display changes. For more detailed information about the **Global Connections** editor, see Help.

To set up remote display changes

1. In the **Graphics** editor, in the **Display Settings** dialog box, every new display is assigned the number 1 by default. Therefore, to use remote display changes, you must assign a unique display number to each Replace and On Top display that you want to change remotely.

   For more information about graphic displays, see Use graphic displays on page 299.

2. In the **Global Connections** editor, assign a tag or an expression to the **Remote Display Number** connection.

3. If you assign a tag to the **Remote Display Number** connection, set up the data source to send a display's number to the connection when you want the display to open.

4. If you assign an expression to the **Remote Display Number** connection, FactoryTalk View monitors the values of the tags used in the expression, and uses the expression result to determine which display to open.

5. If you assign a tag to the **Close An On Top Display** or **Close all On TopDisplays** connection, or both, set up the data source to send a display's number to the connection when you want one or more displays to close.

6. If you assign an expression to the Close An On Top Display or Close all On Top Displays connections, FactoryTalk View monitors the values of the tags used in the expression, and uses the expression result to determine which display to close.

Print displays

Use these global connections in the **Display** tab of the **Global Connections** editor to monitor and control display printing:

- **Display Print Active** — notifies the data source that a display print is in progress.
- **Remote Display Print** — allows the data source to trigger a display print.

The operator can also print the current display by pressing the display print button. For information about setting up this button, see Help.

When the data source or the operator prints a display, everything on the screen is printed, including the current display, pop-up windows, and any visible background applications.

If you plan to print graphic displays remotely, turn off the screen saver. If the screen saver is on when a remote display print is triggered, only the screen saver image is printed.

For information abut turning off the screen saver on personal computers, see your Windows documentation.

For information about turning off the screen saver on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, see the PanelView Plus Terminals User Manual.

Close On Top displays

Use these global connections to close displays remotely:

- **Close an On Top display** — notifies the data source of the number of the On Top display to be closed.
- **Close All On Top Displays** — notifies the application to close all On Top displays whose display number is not zero.

Only replaceable On Top displays can be closed remotely.

Apply parameters to changed displays

Use these global connections to replace tag placeholders in displays that use parameters when they open:

- **Parameter file** — identifies the parameter file for the display being opened remotely.
- **Use Parameter List** — notifies the application that a parameter list is to be used to provide the parameters to the display being opened remotely.
- **Parameter Tag #1-10** — the tag values assigned to these global connections will replace the tag placeholders in the display being opened remotely.

Run macros

Use these global connections in the **Macro** tab of the **Global Connections** editor to run macros:

This connection	Runs this macro
Remote Macro1	Macro1
Remote Macro2	Macro2
Remote Macro3	Macro3
Remote Macro4	Macro4
Remote Macro5	Macro5

Create the macros in the **Macros** editor. Make sure you name them exactly as shown in the right column of the preceding table (with no space in the name).

When the tag or expression assigned to one of these connections changes to a new non-zero value, FactoryTalk View runs the associated macro.

Leave time for a macro to run before starting a new macro. Otherwise, FactoryTalk View will queue the macros, which consumes memory and

could lead to system instability. When you shut down FactoryTalk View ME Station, if a message about executing macros is shown for more than a few seconds this means that macros have been queued.

For information about creating macros, see Use macros on page 561.

Set up backlight intensity remotely

For applications that will run on PanelView Plus 7 and PanelView Plus 6 terminals, use the Remote Backlight Intensity connection in the **Backlight** tab of the **Global Connections** editor to set the backlight intensity of a runtime terminal remotely from a data source.

To update the backlight intensity of the runtime terminal from the data source, assign a tag or an expression to this read-only connection.

This connection	Contains this range of values
Remote Backlight Intensity	0-100

At run time, the application reads the value at the data source and sets the backlight to the percentage of its maximum intensity corresponding to the value. For instance, if the value of the connection is 25, the backlight will be set to 25 percent of its maximum intensity. This value will override the terminal's own backlight intensity setting.

If the value of the connection is greater than 100, the backlight will be set to its maximum intensity. If the value is less than 0, the backlight is set to its minimum intensity. That is, it will be turned off.

Monitor runtime RAM usage

Sometimes it is helpful to monitor runtime RAM usage for troubleshooting purposes. If your application seems to be running slowly, consuming too much memory, or interfering with the operation of other applications on the same personal computer or terminal, it is useful to monitor the exact amount of memory the applications are consuming.

The PanelView Plus and PanelView Plus CE terminals' operating systems have a 32MB RAM process limit. On these terminals, FactoryTalk View ME Station has a tag connection threshold of 26MB. Screen change performance will slow down significantly as the system adds and removes tag connections from the cache.

PanelView Plus 7 and PanelView Plus 6 terminals' operating systems have a 2GB RAM process limit. This creates easier memory management.

Tip: To reduce runtime RAM usage, reduce the number of displays or tags in your application, and restart the application regularly (for example, once a week). Adding more RAM to the terminal will not help. For more information, see Answer ID 39481 in Rockwell Automation Knowledgebase.

Use these global connections in the **Memory** tab of the **Global Connections** editor to monitor runtime RAM usage:

This connection	Provides this information, in kilobytes (Kb)
ME Runtime RAM Usage	The amount of memory being used by your application (and by the MERuntime.exe process)
Total RAM Usage	The total amount of memory being used by all applications (and processes) on the personal computer or terminal
Available RAM	The remaining amount of memory available
Remote RAM Usage	Assign a tag or expression to this connection. When it has a non-zero value, data is sent to the other three connections, if assigned.

You can monitor the values of the **MERuntime RAM Usage**, **Total RAM Usage**, and **Available RAM** connections using data logging or using graphic objects such as numeric displays. The connections are updated every ten seconds as long as the **Remote RAM Usage** connection has a non-zero value. Set up the data source to set this connection to a non-zero value when you want memory monitoring to occur, or assign the same tag or expression to a graphic object such as a **Maintained** push button that the operator can use to turn memory monitoring on and off.

These connections are available when you run FactoryTalk View ME Station on a personal computer and on the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, and PanelView Plus CE terminals.

For PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, and PanelView Plus CE terminals, you can also turn on the display of RAM usage statistics at run time. To do this, in the **Configuration Mode** window, select **Runtime RAM Usage**, and then make your selections in the **Runtime RAM Usage** window. For more information, see the *PanelView Plus Terminals User Manual*.

Set up alarms

This chapter describes:

- Steps for setting up alarms
- Prepare to set up alarms
- How alarms work
- Alarm trigger data types
- Tips for using array tags
- Optional alarm connections.
- Create alarm messages in multiple languages
- The [ALARM], [ALARM BANNER], [ALARM MULTI-LINE], [STATUS], and [HISTORY] displays
- Use displays from the library in your application
- Create your own alarm display
- Open and close the alarm display
- How the alarm list, alarm banner, and alarm status list graphic objects work
- Use buttons to acknowledge, silence, clear, and delete alarms
- Use buttons to sort alarms and reset alarm status

About alarms

An alarm occurs when something goes wrong or is about to go wrong. Alarms can signal that a device or process has ceased operating within acceptable, predefined limits, and can indicate breakdown, wear, or process malfunctions. Alarms are also used to indicate the approach of a dangerous condition.

Alarms are an important part of most plant control applications because an operator must know the instant something goes wrong. It is often equally important to have a record of the alarm and whether the alarm was acknowledged.

PanelView Plus 7 Standard applications, and Compact Machine Edition applications (applications running on PanelView Plus 6 Compact, or PanelView Plus Compact terminals) have a limit of 200 alarm messages.

Multiple language alarm messages

A key component of any alarm system is the messages that appear when alarms occur. FactoryTalk View supports alarm messages in multiple languages. For information about setting up alarm messages in multiple languages, see Create alarm messages in multiple languages on page 135.

Other multiple language alarm features

FactoryTalk View supports using multiple languages for all captions on alarm objects. In addition, these alarm features can be translated into multiple languages:

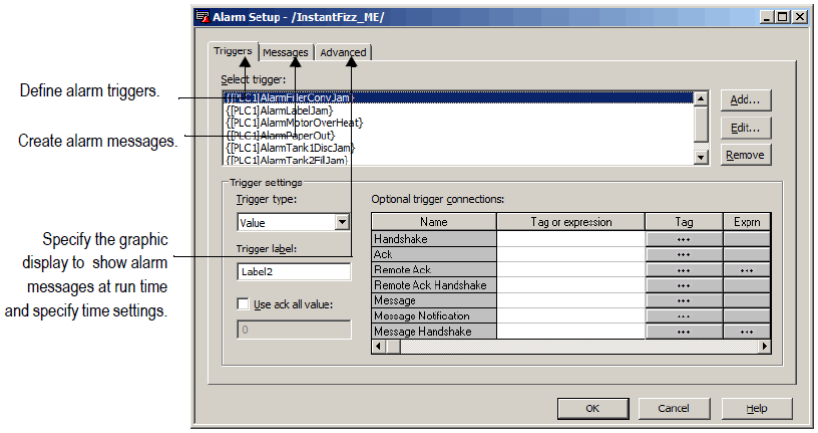
- Title of the alarm history report
- Title of the alarm status report

Alarm objects and reports use the time formats for the current application language. For more information about using multiple languages, see Set up language switching on page 197.

Steps for setting up alarms

Follow these steps to set up alarms:

1. In the **Alarm Setup** editor, set up alarm triggers (the tags or expressions to monitor), define the alarm messages and their trigger values, and specify the graphic display to open when alarms occur (if any).



   Also use this editor to specify trigger types, **Acknowledge all** values, the maximum alarm log file size, the time settings (hold time and update rates), and optional connections.

2. In the **Startup** editor, ensure that the **Alarms** box is selected (it is selected by default). See Help.

3. If desired, in the **Graphics** editor, modify the default [ALARM] display, or create your own graphic display to use for alarms. For example, if you won't be using audible alarm signals, edit the default display to remove the silence alarms button.

   For information about graphic displays, see Use graphic displays on page 299.

4. Test alarms on the runtime system.

Prepare to set up alarms

As your application is running, information is continually sent to the data source about the state of the various processes. For example, your application might be monitoring whether a valve is open or closed, or the temperature in a boiler. Values representing the status of these processes are sent to the data source.

The first step in setting up alarms is determining which processes to monitor for alarm conditions.

The data source

The FactoryTalk View documentation uses the term data source as a generic term that includes all possible sources of tag data, for both data server tags and HMI tags. The data source can be memory or a device such as a programmable controller or an OPC server. FactoryTalk View writes values to and reads values from the data source. The data source is set up to exchange information (in the form of numeric or string values) between FactoryTalk View and the machine that your application is controlling.

Tags and expressions

Before setting up alarms, you must set up data server or HMI tags corresponding to the addresses at the data source that will store the values you want to monitor for alarm conditions. You can monitor analog and digital tags for alarm conditions, including both HMI and data server tags. You cannot monitor string tags.

For information about setting up data server tags, see your OPC data server documentation. For information about creating HMI tags, see Use HMI tags on page 97.

You can also use expressions to perform logical or mathematical calculations on tag values, and then monitor the expression value rather than the original tag value. For example, you could use an expression to monitor whether a tag value has increased or decreased beyond a threshold value: If Tag1 > 90 then 1 else 2.

For information about creating expressions, see Use expressions on page 475.

Identify alarm conditions

Once you have identified the processes you want to monitor for alarms, and the tags or expressions that will store the values representing the status of the processes, you must determine the acceptable range of values for each tag or expression. Then you can set up alarms to notify the operator when a value is outside the normal operating range.

Import and export alarm setup files

The Alarm Import Export Wizard in FactoryTalk View Studio allows you to export alarm information to an XML file, and to import an alarm setup XML file.

For example, you can export an application's alarm setup information, import the setup to another FactoryTalk View application, and then modify it in the new application to suit your requirements. Or, you can modify the file before importing it into the new application.

You can use the Alarm Import Export Wizard to import alarm setup information that has been created using an external programming tool or editor, or you can import a FactoryTalk View XML file.

For more information about importing and exporting alarm setup files, see Import and export alarm XML files on page 597.

How alarms work

This section provides an overview of the key components of your application's alarm system, and describes how the different parts work together.

Alarm triggers and trigger values

You specify the tags and expressions (also known as connections) to monitor for alarm conditions by creating an alarm trigger for each connection.

Each alarm trigger can generate one or more alarm messages, associated with different trigger connection values. For each alarm trigger, you specify the trigger values that will generate alarm messages, and create the messages to show for the trigger values.

The trigger value can be a non-zero integer value or a bit position, depending on which trigger data type you assign. For more information about trigger data types, see Alarm trigger data type on page 129.

An alarm's **Trigger** and **Remote Ack** settings should not be configured to use the same tag. Doing so may cause unpredictable alarm acknowledgement behaviors.

Filter alarm triggers in multiple languages

FactoryTalk View 5.00 and later supports alarm triggers in multiple languages. When you create an alarm trigger, its name is in the current application language. You can export alarm triggers for translation and then import them back into the application. For details, see Set up language switching on page 197.

Various graphic objects allow you to specify the alarm triggers, to which the object's action applies, using the name of the alarm trigger. This is called filtering alarms. When you translate trigger names into other languages, the default language is used to show the trigger name in the object's selection list. These graphic objects allow you to specify alarm triggers using a selection list called the Trigger Label Selector:

- Alarm list
- Alarm status list
- Alarm banner
- Clear alarm history button
- Acknowledge all alarms button
- Print alarm history button
- Print alarm status button

If the trigger label name has not been set up in the default language, the Trigger Label Selector shows a question mark (?) instead of the trigger label name. To correct the display, you must import the trigger labels for the default language.

You can also manually type in the trigger label names to use to filter alarms. If you manually type in the trigger names, specify the names in the default language.

If you change the default language, you must re-specify the trigger labels for each of the graphic objects listed above, using the trigger label names in the new default language. For more information about the default language, see The default language on page 198.

Alarm notification methods

You can use any combination of these methods to notify the operator that an alarm condition has occurred:

- Open an alarm graphic display containing an appropriate alarm message.
- Set off an audible signal (if the application is running on a personal computer).
- Send a message to a printer.
- Send a message to the data source.

If you set up alarm messages in multiple languages, make sure that the data source can either receive the message in Unicode format or convert it into ASCII characters for all the languages you will be using.

To use these methods, select the **Display**, **Audio**, **Print**, and **Message to Tag** options when you create your messages.

If you need to keep a permanent record of alarms, be sure to select the **Print** option. You can also print the contents of the alarm log file periodically, as described on Methods for printing alarm information on page 128. (The alarm log file is also referred to as the alarm history.)

Show alarm information

FactoryTalk View comes with these alarm displays:

- [ALARM], in the Displays folder, contains an alarm banner graphic object that is set up to show the newest active alarm in the alarm log file.
- [ALARM BANNER], a display in the Libraries folder, contains an alarm banner graphic object that is set up to show the newest active alarm in the alarm log file.
- [ALARM MULTI-LINE], a display in the Libraries folder, contains an alarm list graphic object that is set up to show all the alarms in the alarm log file: active, inactive, acknowledged, and unacknowledged.
- [STATUS], a display in the Libraries folder, contains an alarm status list graphic object that is set up to show active alarms. It contains a Goto display button for opening the [HISTORY] display. This display is available in two sizes.
- [HISTORY], a display in the Libraries folder, contains an alarm list graphic object and a Goto display button for opening the [STATUS] display. The alarm list is set up to show all the alarms in the alarm log

file: active, inactive, acknowledged, and unacknowledged. This display is available in two sizes.

By default, the [ALARM] graphic display opens automatically at run time when an alarm is generated.

You can accept the default, edit the [ALARM] display, use one of the other alarm displays, or create your own display. If you select not to automatically open a graphic display for alarm notification, an alternative is to provide the operator with a way to open an alarm display when desired.

For more information, see:

- The [ALARM] display on page 144
- The [ALARM BANNER] display on page 145
- The [ALARM MULTI-LINE] display on page 146
- The [STATUS] display on page 147
- The [HISTORY] display on page 148
- Create your own alarm display on page 149
- The alarm list graphic object on page 150
- The alarm banner graphic object on page 152
- The alarm status list graphic object on page 153

Interact with alarms

Depending on which alarm objects you set up, the operator can:

- Acknowledge one or all alarms, or the alarms for a specific alarm trigger
- Clear and delete alarms
- Silence alarms (if the application is running on a personal computer)
- Sort alarms
- Reset the status of all alarms
- Print alarms

For information about the alarm button graphic objects the operator can use to work with alarms, see Use buttons with the alarm history and alarm objects on page 154.

Use the data source to interact with alarms

You can also set up remote acknowledgement, silencing, and resetting of alarms, to allow the data source to perform these functions. And you can set up the data source to determine which types of alarms to show (active, inactive, acknowledged, and unacknowledged), and to close the alarm display. These topics are discussed later in the chapter.

Methods for acknowledging alarms

A single alarm is acknowledged when:

- The operator selects an alarm in the alarm list and presses the acknowledge alarm button, an enter button object, or the **Enter** key on an external keyboard or keypad.
- The alarm banner has focus and the operator presses the acknowledge alarm button.

A single alarm for a particular trigger is acknowledged when:

- The trigger's **Remote Ack** connection value changes to the alarm's trigger value (or bit position, for bit triggers).

All alarms for a particular trigger are acknowledged when:

- The trigger's **Remote Ack** connection value changes to the **Acknowledge all** value. The **Acknowledge all** value is specified in the **Use ack all value** box in the **Alarm Setup** editor.
- The operator presses an acknowledge all alarms button that is set up to acknowledge the alarms for a specific alarm trigger.

All alarms in the alarm log file are acknowledged when:

- The operator presses an acknowledge all alarms button that is set up to acknowledge all alarms.
- The **Remote Ack All** connection value changes to a new non-zero value.

For more information about acknowledging alarms, see Use alarm buttons to acknowledge, silence, clear, and delete alarms on page 156.

Note: The operator can send button presses to objects that do not have focus. For information about linking buttons to objects, see Link buttons to objects on page 397.

Methods for clearing and deleting alarms

Alarms are deleted from the alarm log file and cleared from all alarm lists and alarm banners when the operator presses the clear alarm history button. You can set up the button to clear alarms for all alarms, or for a specific alarm trigger.

The alarm in the alarm banner is cleared when the operator presses the clear alarm banner button. It is not deleted from the alarm log file.

For more information about clearing and deleting alarms, see Create and delete messages on page 158.

Methods for silencing alarms

The audio alarm indicator is available for applications running on personal computers only.

All alarms are silenced when:

- The operator presses the silence alarms button.
- An alarm whose **Audio** property is turned on is acknowledged.
- The **Remote Silence** connection value changes to a new non-zero value.
- The operator presses the clear alarm history button.

Method for sorting alarms

When the operator presses the sort alarms button, the sort order toggles from time to trigger value or from trigger value to time. The sort order applies to all alarms in all alarm lists and in the alarm log file.

Methods for resetting alarms

Resetting alarms affects how alarms are shown in the alarm status list. When alarms are reset:

- The accumulated time an alarm has been in alarm is reset to 0. If the alarm is still active, the time begins accumulating again.
- The number of times the alarm has been triggered is reset to 0. If the alarm is still active, the number changes to 1.
- The date and time are sent to the system tag *AlarmResetDateAndTimeString*.

The alarms for a specific alarm trigger are reset when:

- The operator presses a clear alarm history button that has been set up to clear and reset alarms for a specific alarm trigger.

All alarms are reset when:

- The operator presses a reset alarm status button.
- The operator presses a clear alarm history button, if the button has been set up to clear and reset all alarms.
- The **Remote Status Reset** connection value changes to a new non-zero value.

For more information about resetting alarms, see Reset alarm status on page 158.

Methods for printing alarm information

In addition to automatically printing each alarm message as it occurs, you can keep a printed record of alarms:

- Use the Print Alarm History button. When the operator presses the button, a report of the contents of the alarm log file is printed. The report can include the time alarms occurred and were acknowledged.

  You can set up this button to print the alarm history for a selected alarm trigger, or for all alarms.

  If you set up alarm messages in multiple languages, messages and trigger labels are printed in the language that they were originally logged in. (Messages are logged in the application language that is current at the time the message is triggered.) All alarm times and acknowledge times are printed in the current application language.

- Use the Print Alarm Status button. When the operator presses the button, a report of the status of alarms is printed. The report can include active alarms, past alarms, or all alarms that have been set up in the **Alarm Setup** editor. The report can include how many times each alarm was triggered, and the accumulated time in alarm.

  You can set up this button to print the alarm status for a selected alarm trigger, or for all alarms.

  If you set up alarm messages in multiple languages, all messages, trigger labels, and times are printed in the current application language.

For information about specifying which printer to use at run time for applications that will run on a personal computer, see Specify the printers to use at run time on page 238. For information about the type of printer to use with a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, see Install hardware and software on a PanelView Plus terminal on page 248.

The alarm log file

As soon as the application starts running, FactoryTalk View begins monitoring trigger connections for alarm conditions. When an alarm occurs, FactoryTalk View adds the associated message to the alarm log file. When the file is full, the oldest messages are deleted to make room for new messages. Specify the maximum number of messages to store in the **Alarm Setup** editor.

For each message, the log file records the time the alarm was triggered and the time the alarm was acknowledged (if it was acknowledged).

The log file is saved every 30 seconds, if there are new alarms. The log file is also saved when the application is shut down.

The alarm log file is also referred to as the alarm history. For example, the operator presses the clear alarm history button to remove all alarms from the log file.

The alarm log file is retained when you restart an application after a shutdown or power loss. You can delete the log file from the runtime computer at application startup.

For information about deleting the log file, see Delete log files on the runtime computer on page 243.

If you download a newer version of an application to the runtime computer, the alarm log file for the older version is deleted automatically.

Alarm trigger data types

When you create alarm triggers, you must specify the type of data the trigger's tag or expression uses. The type of data affects how alarms are triggered.

The Value trigger type

To trigger alarms based on integer or floating-point values, use the Value trigger type. When the value of the trigger connection equals the trigger value of a message, an alarm is generated.

If you use an analog tag (either an HMI tag or a data server tag) or an expression, you can use any non-zero integer or floating-point value to trigger an alarm. Floating-point values are rounded to the nearest integer. For information about how values are rounded, see How values are rounded on page 98.

Trigger values cannot be 0. Digital tags have two possible values, 0 and 1. Therefore, if you use a digital tag (either an HMI tag or a data server tag) you can only use the value 1 to trigger a message. If you want to use a digital tag

to trigger two different messages, create an expression that adds 1 to the digital tag's value. That way, you can use the trigger values 1 and 2.

Example: Integer trigger values

This example shows how to set up alarms using integer trigger values to monitor the level of acid in a 100-gallon tank. Alarms are generated when the tank is 75percent full and 90 percent full.

1. Create an alarm trigger for the tag Acid_tank_level. This tag points to an address in a programmable controller that is linked to a sensor in the tank. The tag's minimum value is 0 and its maximum value is 100.

   Use this expression for the alarm trigger:

   ```
   if ((Acid_tank_level > 74) AND (Acid_tank_level < 90))
   then 1
   else if (Acid_tank_level > 89)
   then 2
   else 0
   ```

2. Use the Value trigger type for the alarm trigger.

3. Specify these trigger values and alarm messages for the alarm trigger:

Trigger Value	Message
1	Warning! The acid tank has exceeded safe fill levels.
2	Danger! The level in the acid tank is too high.

At run time, when the value of Acid_tank_level is 75 or greater, FactoryTalk View generates the first alarm message. The second message is generated when the tag value is 90 or greater.

Using the expression in step 1 allows a range of values to trigger each alarm. This is useful in case the tag is not being read at the exact moment it reaches a threshold level.

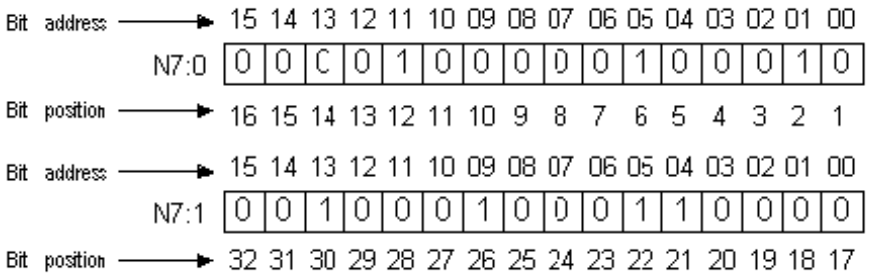
The Bit trigger type

Use the Bit trigger type to generate multiple simultaneous alarm messages. You can assign an array tag (consisting of up to 1,024 bits) to the trigger connection. Each bit in the array whose value changes from 0 to 1 triggers an alarm (if a message is set up for the bit position).

Example: Trigger values using bit positions

This example shows how to use bit positions to generate multiple simultaneous alarms. The array tag uses 32 bits, from N7:0/00 to N7:1/15.

This diagram shows the bit addresses and bit positions for the array tag:



The tag is currently generating alarms at bit positions 2, 6, 12, 21, 22, 26, and 30.

To set up alarms for this array tag:

1. Create an alarm trigger for the array tag. Use the Bit trigger type.

   You must use a direct reference for the array tag. The tag uses the Integer data type (16 bits per element). Append L2 to the tag's starting address to indicate that the trigger will monitor 2 tag elements (32 bits), as follows:

   ```
   {::[PLC5]N7:0,L2}
   ```

   PLC5 is the RSLinx Enterprise device shortcut name. The two colons at the beginning are necessary when the tag reference contains a colon.

2. Specify trigger values and alarm messages for the alarm trigger. Each trigger value corresponds to a bit position (not a bit address).

Bit in the array (bit address)	Bit position	Trigger value	Message
00	1	1	Line 1: Conveyor has stopped.
01	2	2	Line 1: Power failure.
02	3	3	Line 2: Conveyor has stopped.
03	4	4	Line 2: Power failure.
..	..	..	..
31	32	32	Oven door open.

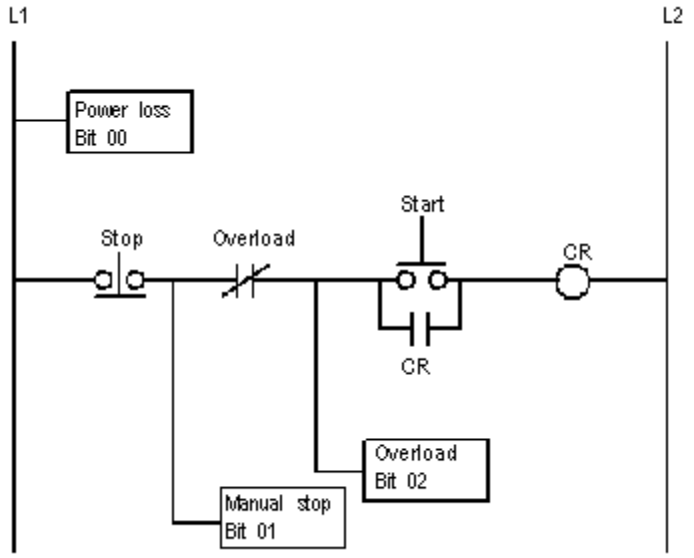
The Least Significant Bit (LSBit) trigger type

Use the Least Significant Bit trigger type to generate alarm messages based on a priority sequence that is determined by bit position. You can assign an array tag (consisting of up to 1,024 bits) to the trigger connection. When multiple bits in the array change from 0 to 1, only the alarm with the lowest bit position is generated.

Example: Trigger values using least significant bits

This example shows how to use the Least Significant Bit trigger type to prioritize which alarm is generated when multiple alarm conditions occur.

In this example, a programmable controller monitors a motor's power, manual stop, and overload status. The diagram indicates the location of sensors that are linked to an array tag in the programmable controller.



If power to the motor is lost, the manual stop and overload switch also lose power, generating alarms for all three motor parts. The only alarm the operator needs to see is the alarm for the motor, since the cause of the alarm is power loss to the motor, not a problem with the other two motor parts.

If someone stops the motor manually, power to the overload switch is lost. Alarms are generated for the manual stop and the overload switch, but the only alarm the operator needs to see is the alarm for the manual stop.

1. Create an alarm trigger for the tag Motor_starter. The tag uses 16 bits, and points to the programmable controller address N7:61, although only the first three bit positions are used in this example. Use the LSBit (Least Significant Bit) trigger type.

Because you are using only the first three bits in a single tag element, there is no need to specify a length for the array tag in this example. You can use a simple tag type.

However, if you were also monitoring bits in N7:62, you would need to add L2 to the address, as follows:

```
{::[PLC5]N7:61,L2}
```

2. Specify these trigger values and alarm messages for the alarm trigger:

Bit in the array (bit address)	Bit position	Trigger value	Message
00	1	1	The motor has lost power.
01	2	2	The motor has stopped.
02	3	3	The overload switch has lost power.

At run time, if power to the motor is lost, the programmable controller changes all three bit values from 0 to 1, but FactoryTalk View generates the first alarm message only (since bit 00 is the lowest — that is, least significant — bit in alarm). If the operator acknowledges the first alarm and power is not yet restored, the second alarm is generated, and so on.

Tips for using array tags

You can use these tag data types for array tags:

Data type	Number of bits
Byte	8
Integer	16
Word	16
Long Integer	32
Double Word	32

The right column shows the number of bits for each data type. This is useful for helping to determine how many data elements to address to achieve the required number of bits. To create an array tag, specify how many elements to use, beginning with the first element at the tag's address.

For example, if you want to monitor 128 bit positions for an alarm trigger, and you are using the Long Integer data type, you would append the modifier [4] to the tag name (because 4 x 32 = 128). For detailed information about tag syntax, see RSLinx Enterprise tag syntax on page 134.

You cannot use HMI tags for array tags. You must use data server tags for array tags.

Equivalent data types

Different processors and OPC servers use different terminology for tag data types. This section provides information about equivalent data types that you can use for array tags, with the associated number of bits for each.

PLC and SLC tags

When creating array tags, you can use PLC and SLC tags with this data type:

Data type	Number of bits
Short Integer	16

Data server tags with the Short Integer data type are shown in the **Tag Browser** with the Item Canonical Data Type of Integer.

To view a tag's Item Canonical Data Type

- In the **Tag Browser**, right-click the tag, and then select **Properties**.

Logix5000 tags

When creating array tags, you can use Logix5000 tags with these data types:

Data type	Number of bits
SINT	8
INT	16
DINT	32

Data server tags with the data types described in the previous table are shown in the **Tag Browser** with the Item Canonical Data Types of Character, Short Integer, and Long Integer, respectively.

RSLinx Enterprise tag syntax

To create an RSLinx Enterprise array tag, use this syntax to specify the length of the array:

{tagname,Larraylength}

For example, {::[PLC5]N7:0,L5}

The tag N7:0 uses the Short Integer data type (16 bits), so the array tag consists of 80 bits (16 x 5).

When the tag name contains a colon (:), put two colons before the RSLinx Enterprise device shortcut name.

KEPServer Enterprise tag syntax

To create a KEPServer Enterprise array tag, use this syntax to specify the length of the array:

tagname [*arraylength*]

For example, Chan1.Dev1.Tag1 [3]

The tag Tag1 uses the Long Integer data type (32 bits), so the array tag consists of 96 bits (32 x 3).

Alternatively, you can define the tag length in KEPServer Enterprise when you create the tag, and then just select the tag name in FactoryTalk View Studio. For more information, see KEPServer Enterprise Help.

Create alarm messages in multiple languages

FactoryTalk View 5.00 and later supports alarm messages in multiple languages. When you create alarm messages, they are in the current application language. You can export the alarm messages for translation and then import them back into the application. For details, see Set up language switching on page 197.

Language switching alarm messages in FactoryTalk View ME Station 4.00

For applications that will run in FactoryTalk View ME Station version 4.00, use the CurrentLanguage( ) expression function to specify offsets for each trigger's messages in the **Alarm Setup** editor. In the editor, divide the messages for each trigger into sections for each language. For information about the CurrentLanguage( ) function, see Language function on page 487.

Optional alarm connections

When an operator acknowledges an alarm, the acknowledge time is recorded in the alarm log file and the alarm is silenced. This might be all you require of your alarm system.

However, you can use the optional alarm connections in the **Alarm Setup** editor to set up more sophisticated interactions with the data source when alarms are triggered, acknowledged, silenced, and reset. For example, you can set up the data source to acknowledge, silence, and reset alarms. You can also use optional alarm connections to close the alarm display or to allow the data source to close the alarm display.

There are two sets of optional alarm connections:

- Connections that work with a specific alarm trigger. You can assign a different set of connections to each alarm trigger.
- Connections that apply to all alarms

You can also assign connections to alarm lists, to allow the data source to determine which types of alarms to show in the lists. For more information, see How the alarm list graphic object works on page 150.

Connections that work with a specific alarm trigger

You can assign a different set of these connections to each alarm trigger, or to only one or some alarm triggers:

- **Handshake** — Assign a tag to this connection to notify the data source when the trigger's value changes.
- **Ack** — Assign a tag to this connection to notify the data source when the operator acknowledges an alarm (or all alarms).
- **Remote Ack** — Assign a tag or an expression to this connection to allow the data source to acknowledge alarms.
- **Remote Ack Handshake** — Assign a tag to this connection to notify the data source when a remote acknowledgement occurs.
- **Message** — Assign a tag to this connection to send alarm messages to the connection. Make sure the tag supports the type of data sent in the alarm message. For example, if the message is a string of text, assign a string tag to the **Message** connection.
- **Message Notification** — Assign a tag to this connection to notify FactoryTalk View that an alarm message has been sent to the connection and FactoryTalk View must wait before sending a new message.
- **Message Handshake** — Assign a tag to this connection if you want the data source to notify FactoryTalk View when it has read the message.

Assign tags or expressions to these connections when you create your alarm triggers. For more detailed information about how these connections work, see the next sections.

How the Handshake connection works

The **Handshake** connection is useful for triggers that use the Value data type. Program the data source to queue alarm notifications when multiple alarms are generated for the same trigger. Use the **Handshake** connection to notify the data source that FactoryTalk View has detected the alarm notification. Then the data source can send the next alarm to FactoryTalk View.

When the application starts, the **Handshake** connection has a value of 1. When the trigger connection's value changes, the **Handshake** connection's value toggles from 1 to 0. The next time the trigger value changes, the **Handshake** connection's value toggles from 0 to 1.

A change in the trigger connection's value does not necessarily indicate an alarm. The value might still be within acceptable limits.

How the Ack connection works

When the application starts, this connection has a value of 0.

How the value changes

- When the operator acknowledges an alarm by pressing the acknowledge alarm button, FactoryTalk View sends the alarm's trigger value (or bit position, for bit triggers) to this connection, and holds the value as long as the operator presses the button, or for the duration of the hold time, whichever is longer. Then the connection's value is reset to 0.
- When the operator acknowledges all alarms, or the alarms for this trigger only, by pressing the acknowledge all alarms button, FactoryTalk View sends the trigger's **Acknowledge all** value to this connection, and holds the value as long as the operator presses the button, or for the duration of the hold time, whichever is longer. Then the connection's value is reset to 0.
- When the **Remote Ack connection** changes to a new non-zero value that matches the trigger value of an unacknowledged alarm, FactoryTalk View sends the trigger's value (or bit position, for bit triggers) to this connection, and holds the value for the duration of the hold time. Then the connection's value is reset to 0.

To avoid confusion about whether a specific trigger's alarm individual alarm has been acknowledged or all alarms for the trigger have been acknowledged, make sure the **Acknowledge all** value is not the same as one of the trigger values.

How the Remote Ack connection works

The **Remote Ack** connection allows for the remote acknowledgement of alarms. The data source writes the alarm's trigger value (or bit position, for bit triggers) to this connection, and the unacknowledged alarm with this trigger value is acknowledged.

If you assign this connection and specify an **Acknowledge all** value for the trigger, when the data source sends the **Acknowledge all** value to this connection, all unacknowledged alarms for the trigger are acknowledged.

Make sure that the **Acknowledge all** value is not the same as one of the trigger values.

Set up the data source to send the correct value to the **Remote Ack** connection when you want a remote acknowledgement to take place.

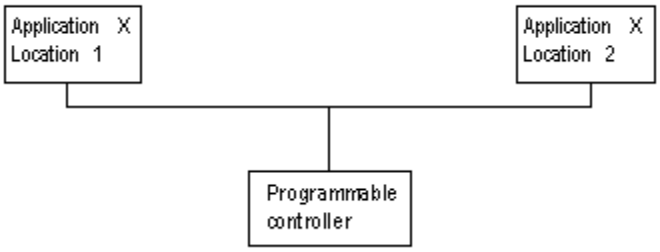
Remote acknowledgement does not take place if the hold time is in effect for the **Ack** connection.

Note: An alarm's **Trigger** and **Remote Ack** settings should not be configured to use the same tag. Doing so may cause unpredictable alarm acknowledgement behaviors.

Example: Use the Remote Ack connection

This example shows how to use the **Remote Ack** connection to acknowledge an alarm.

In this example, the same application is run at two different locations on the plant floor, and both terminals are connected to the same programmable controller. All the tags in the example refer to addresses in the programmable controller.



1. Create an alarm trigger for a tag called *Alarm*. Use the **Value** trigger type.
2. Assign a tag called *Ack* to the **Ack** connection.
3. Assign a tag called *Remote_ack* to the **Remote Ack** connection.
4. Create an alarm message for the alarm trigger, with the trigger value 1.
5. Set up the data source to write the value at the **Ack** connection to the **Remote Ack** connection whenever the value of the **Ack** connection changes from 0 to a non-zero value.

At run time, when an alarm with the trigger value 1 is generated, the alarm message appears at both locations simultaneously. If the operator acknowledges the alarm at Location 1, FactoryTalk View writes the value 1 to the **Ack** connection.

Since the **Ack** connection is write-only (not read), the acknowledgement does not appear at Location 2. However, the programmable controller writes the value from the **Ack** connection (1) to the **Remote Ack** connection, and the alarm at Location 2 is acknowledged.

How the Remote Ack Handshake connection works

This connection is used to notify the data source that the remote acknowledgement has been detected by FactoryTalk View.

When the application starts, the **Remote Ack Handshake** connection has a value of 1. When the **Remote Ack** connection value changes, the **Remote Ack Handshake** connection value toggles from 1 to 0. The next time the **Remote Ack** value changes, the **Remote Ack Handshake** value toggles from 0 to 1.

The **Remote Ack Handshake** value toggles whether or not the new **Remote Ack** value matches a trigger value.

Ensure alarm messages are read by the data source before sending new messages

This section explains how the **Message**, **Message Notification**, and **Message Handshake** connections work.

To ensure an alarm message is read by the data source before FactoryTalk View sends a new message, use message handshaking. While message handshaking is in effect for an alarm message, FactoryTalk View cannot send a new message to the alarm trigger's **Message** connection.

Methods of alarm message handshaking

Alarm handshaking works by setting the alarm trigger's **Message Notification** connection to 1. As long as the **Message Notification** connection is set to 1, new messages cannot be sent to the **Messages** connection. How the **Message Notification** connection is reset to 0 depends on how you set up alarm message handshaking.

There are two ways you can use alarm message handshaking:

- To hold the message at the data source for a specific period of time.
- To hold the message at the data source until the data source notifies FactoryTalk View that the message has been read.

Choose the method that best suits your application needs and communication system.

Hold the message for a specific period of time

To set up an alarm trigger's alarm message handshaking so that the message at the **Message** connection is held for a specific period of time, assign a tag to the **Message Notification** connection and specify a hold time in the **Advanced** tab of the **Alarm Setup** editor.

How handshaking works

This method of alarm message handshaking works as follows:

1. When an alarm occurs, the alarm message is sent to the **Message** connection.
2. The **Message Notification** connection is set to 1.

   As long as the **Message Notification** connection is set to 1, FactoryTalk View cannot send new messages to the data source.
3. The **hold time** timer begins timing.
4. When the hold time has expired, the **Message Notification** connection is reset to 0 and FactoryTalk View can send a new message to the **Message** connection.

Hold the message until the data source acknowledges that it has read the message

To set up an alarm trigger's alarm message handshaking so that the message at the **Message** connection is held until the data source notifies FactoryTalk View that it has read the message, use two connections: the **Message Notification** connection and the **Message Handshake** connection.

Set up the data source to send a new non-zero value to the **Message Handshake** connection when it has read the message at the **Message** connection.

How handshaking works

If you use the **Message Handshake** connection, handshaking works like this:

1. When an alarm occurs, the alarm message is sent to the **Message** connection.

2. The **Message Notification** connection is set to 1.

   As long as the **Message Notification** connection is set to 1, FactoryTalk View cannot send new messages to the data source.

3. When the data source has read the message, it sends a new non-zero value to the **Message Handshake** connection.

4. The **Message Notification** connection is reset to 0 and FactoryTalk View can send a new message to the **Message** connection.

How messages are queued

FactoryTalk View can queue up to 128 messages while it waits for the **Message Notification** connection to be reset to 0. Queued messages are sent to the data source on a first in, first out basis.

If the alarm message queue fills before the **Message Notification** connection is reset to 0, an error message is sent to FactoryTalk Diagnostics.

How the Message connection works

This connection is used to send the message associated with a trigger value to the data source.

The message is sent only if the alarm message's **Message to Tag** option is selected.

If you are going to generate text alarm messages in multiple languages, make sure the tag assigned to this connection can accommodate the string length of the messages in each language. For information about using multiple languages, see Set up language switching on page 197.

How the Message Notification connection works

This connection is used to notify FactoryTalk View that an alarm message has been sent to the data source and FactoryTalk View must wait to send another message.

When the application starts, the **Message Notification** connection is set to 0. When a message is written to the **Message** connection, the **Message Notification** connection value changes to 1. When the hold time expires, or the **Message Handshake** connection changes to a new non-zero value, the **Message Notification** connection value changes from 1 to 0.

Messages for an alarm trigger are queued if the **Message Notification** connection is set to 1.

How the Message Handshake connection works

Use the **Message Handshake** connection to reset the **Message Notification** connection when the data source has read the alarm message.

Set up the data source to send a new non-zero value to the **Message Handshake** connection when it has read the message at the **Message** connection.

Connections that apply to all alarms

These connections apply to all alarms:

- **Silence** — Assign a tag to this connection to notify the data source that all alarms have been silenced (for applications that will run on a personal computer only).
- **Remote Silence** — Assign a tag or an expression to this connection to allow the data source to silence all alarms (for applications that will run on a personal computer only).
- **Remote Ack All** — Assign a tag to this connection to allow the data source to acknowledge all alarms at once.
- **Status Reset** — Assign a tag to this connection to notify the data source that the alarm status has been reset.
- **Remote Status Reset** — Assign a tag or expression to this connection to allow the data source to reset the alarm status.
- **Close Display** — Assign a tag to this connection to notify the data source that the alarm display has closed.
- **Remote Close Display** — Assign a tag or expression to this connection to allow the data source to close the alarm display.

Assign tags or expressions to these connections in the **Advanced** tab of the **Alarm Setup** editor. For more detailed information about how these connections work, see the next sections.

How the Silence connection works

When the application starts, this connection has a value of 0. When alarms are silenced, this connection is set to 1 for the hold time and the internal beeper is turned off. At the end of the hold time, the connection is reset to 0.

If the silence event is triggered by a button press, this connection is set to 1 for the hold time or for the duration of the button press, whichever is longer. At the end of this time, the connection is reset to 0.

If subsequent alarms (that have been set up to sound the internal beeper) are generated, the alarms sound the beeper regardless of the Silence connection value or hold time status.

While the hold time is in effect, new alarms cannot be silenced.

How the Remote Silence connection works

When this connection changes to a new non-zero value, all alarms are silenced. Alarms can be silenced using other methods regardless of this connection's value.

Set up the data source to send a new non-zero value to the **Remote Silence** connection each time you want a remote silencing of alarms to take place.

How the Remote Ack All connection works

When this connection changes to a new non-zero value, all unacknowledged alarms are acknowledged.

Set up the data source to send a new non-zero value to the Remote Ack All connection each time you want a remote acknowledgement of all alarms to take place.

How the Status Reset connection works

When the application starts, this connection has a value of 0. If a reset alarm status or clear alarm history button is pressed, this connection is set to 1 for the hold time or for the duration of the button press, whichever is longer. At the end of this time, the connection is reset to 0.

The **Status Reset** connection is also set to 1 if the **Remote Status Reset** connection changes to a new non-zero value, and remains set for the hold time.

While the hold time is in effect, the alarm status cannot be reset again. The status of alarms keeps updating during the hold time.

How the Remote Status Reset connection works

When this connection changes to a new non-zero value, the status of all alarms is reset, as described on Methods for resetting alarms on page 127. Alarms can be reset using other methods regardless of this connection's value.

Set up the data source to send a new non-zero value to the Remote Status Reset connection each time you want a remote resetting of alarm status to take place.

How the Close Display connection works

When the application starts, this connection has a value of 0. If the alarm display (assigned in the **Alarm Setup** editor) closes, this connection is set to 1 for the hold time. At the end of the hold time, the connection is reset to 0.

If subsequent alarms are generated, the alarm display opens again regardless of the **Close Display** connection value or hold time status.

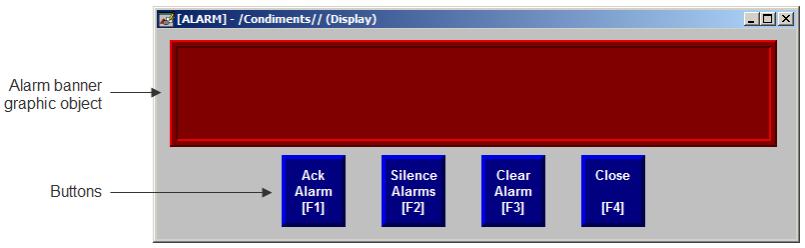
How the Remote Close Display connection works

When this connection changes to a new non-zero value, the alarm display closes. The alarm display can be closed using other methods regardless of this connection's value.

Set up the data source to send a new non-zero value to the **Remote Close Display** connection each time you want a remote closing of the alarm display to take place.

The [ALARM] display

When you create an application, it comes with a graphic display called [ALARM]. The [ALARM] display is the default display for showing alarm messages at run time. It contains an alarm banner graphic object that is set up to show a single active alarm.



You can use the [ALARM] display as is, or modify the display. For example, you can change the color of the objects, or add and remove buttons.

Another option is to create your own graphic display to use when an alarm occurs, as described on Create your own alarm display on page 149. Or, you can use one of the alarm displays in the graphic library. These displays are described in the next four sections.

A copy of the [ALARM] display is included in the graphic library, with the name [ALARM BANNER].

The alarm banner graphic object

The [ALARM] display contains an alarm banner graphic object, which lists the most recent alarm message. You can set up the alarm banner to queue new alarms until the shown alarm has been acknowledged, or to show new alarms as they occur. The alarm banner in the [ALARM] display is set up to show new alarms as they occur and to show active alarms only (but you can edit it, if desired).

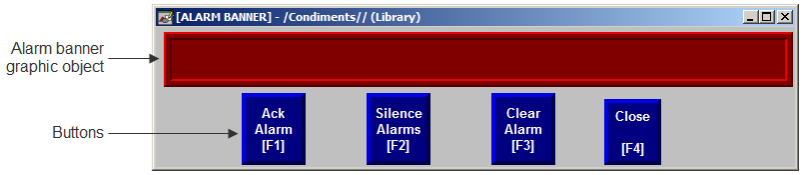
For more information about the alarm banner, see How the alarm banner graphic object works on page 152.

Buttons in the [ALARM] display

The [ALARM] display contains alarm buttons for acknowledging, silencing, and clearing alarms, as well as a button for closing the display. For information about how the buttons work, see Use buttons with the alarm history and alarm objects on page 154.

The [ALARM BANNER] display

The Libraries folder contains a graphic display called [ALARM BANNER]. The [ALARM BANNER] display allows the operator to see a single alarm at a time.



The alarm banner graphic object

The [ALARM BANNER] display contains an alarm banner graphic object, which lists the most recent alarm message. You can set up the alarm banner to queue new alarms until the shown alarm has been acknowledged, or to show new alarms as they occur. The alarm banner in the [ALARM BANNER] display is set up to show new alarms as they occur and to show active alarms only (but you can edit it, if desired).

For more information about the alarm banner, see How the alarm banner graphic object works on page 152.

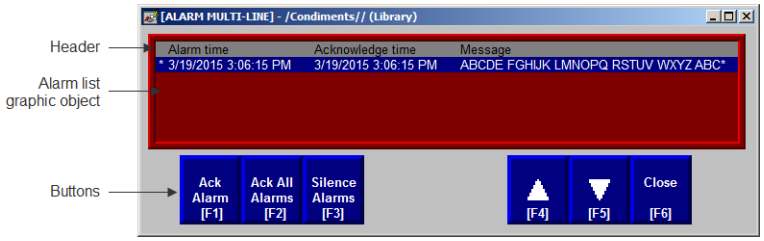
Buttons in the [ALARM BANNER] display

The [ALARM BANNER] display contains alarm buttons for acknowledging, clearing, and silencing alarms, as well as a button for closing the display. For

information about how the buttons work, see Use buttons with the alarm history and alarm objects on page 154.

The [ALARM MULTI-LINE] display

The Libraries folder contains a graphic display called [ALARM MULTI-LINE]. The [ALARM MULTI-LINE] display allows the operator to see multiple alarms at once.



You can use the [ALARM MULTI-LINE] display as is, or modify the display. For example, you can select which alarm triggers' alarms to show in the list.

The alarm list graphic object

The [ALARM MULTI-LINE] display contains an alarm list graphic object, which lists the time the alarms occurred and were acknowledged, as well as the alarm messages. You can set up the alarm list to show any combination of active, inactive, acknowledged, and unacknowledged alarms. The alarm list in the [ALARM MULTI-LINE] display is set up to show all alarms (but you can edit it, if desired).

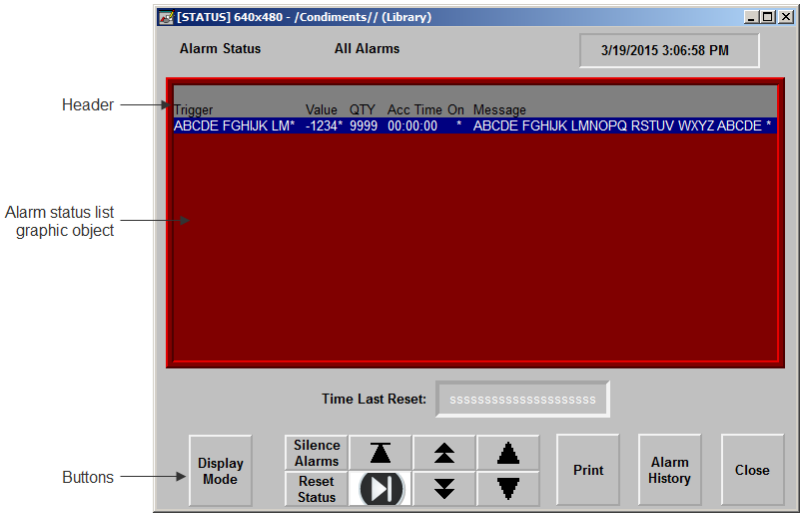
For more information about the alarm list, see How the alarm list graphic object works on page 150.

Buttons in the [ALARM MULTI-LINE] display

The [ALARM MULTI-LINE] display contains alarm buttons for acknowledging and silencing alarms, as well as buttons for scrolling the list and closing the display. For information about how the buttons work, see Use buttons with the alarm history and alarm objects on page 154.

The [STATUS] display

The Libraries folder contains a graphic display called [STATUS]. The [STATUS] display allows the operator to see the status of all the alarms that have been set up in the **Alarm Setup** editor. The [STATUS] display comes in two sizes, 640x480 and 800x600.



You can use the [STATUS] display as is, or modify the display. For example, you can select which alarm triggers' alarms to show in the list, or remove buttons that you don't want to use.

The alarm status list graphic object

The [STATUS] display contains an alarm status list graphic object, which lists the alarm messages. You can set up the alarm status list to show the status of all alarms that have been set up, active alarms only, or all alarms that have occurred since the alarm status was last reset. The alarm status list in the [STATUS] display is set up to show the status of active alarms (but you can edit it, if desired).

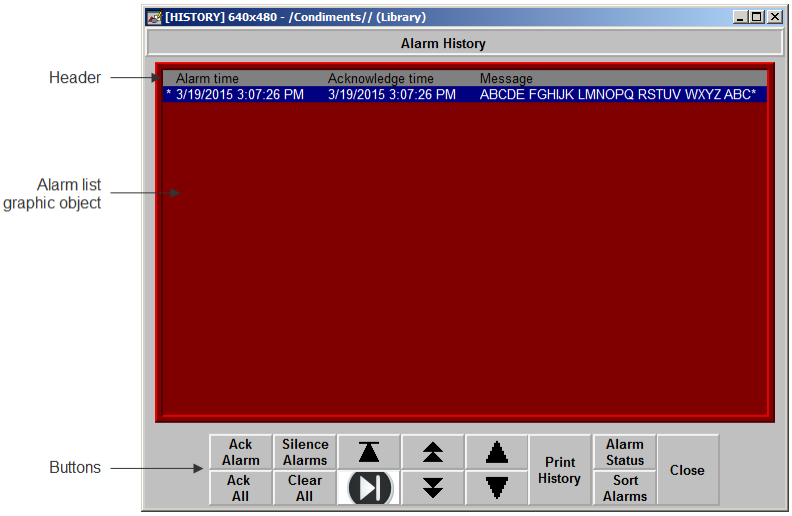
For more information about the alarm status list, see How the alarm status list graphic object works on page 153.

Buttons in the [STATUS] display

The [STATUS] display contains alarm buttons for resetting and silencing alarms, changing the display mode, printing the status of alarms, and opening the [HISTORY] display, as well as buttons for scrolling the list and closing the display. For information about how the buttons work, see Use buttons with the alarm history and alarm objects on page 154.

The [HISTORY] display

The Libraries folder contains a graphic display called [HISTORY]. It is similar to the [ALARM MULTI-LINE] display, but the alarm list graphic object is larger (to show more alarm messages at once), and the [HISTORY] display contains more buttons. The [HISTORY] display comes in two sizes, 640x480 and 800x600.



You can use the [HISTORY] display as is, or modify the display. For example, you can select which alarm triggers' alarms to show in the list, or remove buttons that you don't want to use.

The alarm list graphic object

The [HISTORY] display contains an alarm list graphic object, which lists the time the alarms occurred and were acknowledged, as well as the alarm messages.

You can set up the alarm list to show any combination of active, inactive, acknowledged, and unacknowledged alarms. The alarm list in the [HISTORY] display is set up to show all alarms (but you can edit it, if desired).

For more information about the alarm list, see How the alarm list graphic object works on page 150.

Buttons in the [HISTORY] display

The [HISTORY] display contains alarm buttons for acknowledging, silencing, and clearing alarms, sorting the list of alarms, printing the alarm history list, and opening the [STATUS] display, as well as buttons for scrolling the list and closing the display. For information about how the buttons work, see Use buttons with the alarm history and alarm objects on page 154.

Use displays from the library in your application

The previous four sections described the [ALARM BANNER], [ALARM MULTI-LINE], [STATUS], and [HISTORY] displays that are included in the Libraries folder. You can copy objects from the displays to your own display, or you can copy the entire displays into your application.

For information about copying objects from a library into your graphic display, see Copy objects on page 372.

The graphic libraries are available on the development computer, but do not appear at run time. To use a display in the library as a graphic display at run time, you must add the library display into your application's folder of graphic displays. For details, see Use libraries as displays in your application on page 316.

Example: Use the [ALARM] and [STATUS] displays together

To use the [ALARM] display to alert the operator about alarms as they occur, and the [STATUS] display to show how many times and for how long alarms have been active:

1. In the **Alarm Setup** editor, in the **Advanced** tab, select the [ALARM] display as the display to open when alarms are triggered, if it is not already selected. (It is selected by default.)
2. Add the [STATUS] display from the library.
3. Edit the [ALARM] display by adding a Goto display button that opens the [STATUS] display when pressed.

Create your own alarm display

You can create your own graphic display for displaying and responding to alarms. For example, you could create a display with a static text object that notifies the operator that an alarm has occurred, and a Goto display button that the operator can press to open a display that lists the actual alarm message.

If you create your own graphic display, use an On Top display and select the **Cannot Be Replaced** option.

For information about the graphic objects you can use to show alarm information, see the information starting on How the alarm list graphic object works on page 150. For information about creating graphic displays and graphic objects, see Use graphic displays on page 299 and Use graphic objects on page 331.

Open and close the alarm display

Open the display

The alarm display you specify in the **Advanced** tab of the **Alarm Setup** editor (either the default [ALARM] display, a display you copy from the library, or your own display) is automatically opened whenever a trigger

connection's value matches a trigger value (if you selected the **Display** option for the trigger value).

You can also create a Goto display button that the operator can press to open the alarm display. For information about setting up a Goto display button and specifying the display to open, see Help.

Close the display

The operator can close the display by pressing a **Close Display** button.

The display closes automatically under these circumstances:

- When the operator presses an acknowledge all alarms button and causes the newest alarm in the alarm history to be acknowledged.
- When the operator presses a clear alarm history button and causes the newest alarm in the alarm history to be deleted.
- When the **Remote Close Display** connection changes to a new non-zero value.
- When the **Remote Ack All** connection changes to a new non-zero value.
- When the newest alarm is acknowledged.

If you don't want the display to close when the newest alarm is acknowledged, you can turn off this option in FactoryTalk View ME Station.

To change how the display closes

1. In FactoryTalk View ME Station, click **Terminal Settings**.
2. Double-click **Alarms**.
3. Specify how you want the display to close.

How the alarm list graphic object works

The alarm list graphic object displays the time an alarm was triggered, and the time it was acknowledged (if you set up the object to show acknowledged alarms).

At run time, when a trigger connection at the data source matches a message's trigger value, an alarm appears in the alarm list. The alarm list can be in the [ALARM MULTI-LINE] or [HISTORY] display, in an alarm display you have created, or can be placed on any display in your application.

You can use multiple alarm lists, in the same display or in different displays. Each alarm list displays information from the same alarm log file, although you can set up different lists to display different information.

For information about setting up alarm lists, see Help.

What is shown

- If you set up the list to show the alarms for specific alarm triggers, only alarms for those triggers are displayed.
- If the list is set up to show unacknowledged alarms only, the alarms shown in the list are unacknowledged and the acknowledge time column, if any, is always blank.
- If the list is set up to show both acknowledged and unacknowledged alarms, acknowledged alarms can show a symbol (which you can specify) at the left end of the row, and the acknowledge time appears in the acknowledge time column, if shown.
- If the list is set up to show both active and inactive alarms, active alarms can show a symbol (which you can specify) at the left end of the row. If both the acknowledge symbol and active symbol are shown, the active symbol column is to the right of the acknowledge symbol column.
- If the message is too long to fit in the object, the last shown character is replaced with an asterisk. Similarly, if a column heading is too long to fit in the column, the last displayed character is replaced with an asterisk. You can specify how many lines to allow for each alarm message, from 1 to 10.
- The number of alarm messages that fits in the display depends on the height of the alarm list, the list's font size, how many lines you have specified for each alarm message, and whether the column headings are shown.
- If alarms are currently being sorted by time, alarms are listed with the newest alarms on top.
- If alarms are currently being sorted by trigger value, alarms from the first trigger in the **Alarm Setup** editor are listed first, with alarms from subsequent triggers listed after. Alarms in the list from the same trigger are grouped together and then sorted by trigger value, from lowest to highest.
- If there are multiple instances of the same alarm, these alarms are sorted by time with the newest on top.
- If you assign a tag or expression to any of the ActiveAcknowledged, ActiveUnacknowledged, InactiveAcknowledged, or InactiveUnacknowledged connections, when a connection's value is a non-zero value, the related type of alarm is displayed in the alarm list. The connection value overrides the setting for the list in the **Alarm List Properties** dialog box.
- If you set up alarm messages in multiple languages, messages are shown in the language that they were originally logged in. All alarm

and acknowledgement times are displayed in the current application language.

How the list scrolls

- When a display containing an alarm list is opened, the highlight bar or cursor is at the top of the list: on the most recent alarm if sorted by time; or on the first alarm for the first trigger, if sorted by trigger value.
- If alarms are sorted by time, and the top alarm is selected, as new alarms occur, the old alarms scroll down, but the highlight bar or cursor remains at the top.
- If alarms are sorted by time, when the operator selects an alarm other than the top one in the list (by using the move down button), and new alarms occur, they are added above the visible area if the list is full. The currently selected alarm continues to be selected and maintains its position in the displayed portion of the list.
- If alarms are sorted by trigger value, as new alarms occur the currently selected alarm continues to be selected and maintains its position in the list.
- If the sort order changes, the selected alarm continues to be selected, but it might be displayed in a different position in the list.

How the alarm banner graphic object works

The alarm banner graphic object shows a single, unacknowledged alarm.

At run time, when a trigger connection at the data source matches a message's trigger value, an alarm appears in the alarm banner. The alarm banner can be in the [ALARM] display or [ALARM BANNER] display, in an alarm display you have created, or can be placed on any display in your application.

You can use multiple alarm banners, in the same display or in different displays. You can set up different banners so that one displays the most recent alarm, and the other queues alarms until the displayed alarm is acknowledged.

For information about setting up alarm banners, see Help.

What is shown

- If you set up the banner to show the alarms for specific alarm triggers, only alarms for those triggers are displayed.
- You can set up the banner to queue new alarms until the operator clears the current alarm, or to always display the most recent alarm.

- When a display containing an alarm banner is first opened, the alarm banner is blank, unless the display is the alarm display specified in the **Alarm Setup** editor and it was opened in response to an alarm.
- When the shown alarm is acknowledged, it is removed from the alarm banner. If there are no newer alarms, the banner is blank.
- If the operator presses a clear alarm banner button, the banner is blank.
- If the operator presses a clear alarm history button or if all alarms are acknowledged, the banner is blank.
- If the banner is set up to show both active and inactive alarms, when an alarm is active, an asterisk (*) appears beside the message.
- If you set up alarm messages in multiple languages, messages and trigger labels are shown in the language that they were originally logged in. All alarm times are shown in the current application language.

How the alarm status list graphic object works

The alarm status list graphic object shows the status of alarms, including whether an alarm has been triggered, how many times an alarm has been triggered, and for how long.

The alarm status list can be in the [STATUS] display, in an alarm display you have created, or can be placed on any display in your application.

You can use multiple alarm status lists, in the same display or in different displays. You can set up different lists to show different information.

For information about setting up alarm status lists, see Help.

What is shown

- If you set up the list to show the alarms for specific alarm triggers, only alarms for those triggers are shown.
- If an alarm is active, an asterisk (*) appears in the alarm state column, if shown.
- If the message is too long to fit in the object, the last character that would fit is replaced with an asterisk. Similarly, if a column heading is too long to fit in the column, the last character that would fit is replaced with an asterisk. You can specify how many lines to allow for each alarm message, from 1 to 10.
- The number of alarm messages that fits in the display depends on the height of the alarm status list, the list's font size, how many lines you have specified for each alarm message, and whether the column headings are displayed.
- For value-triggered alarms, the accumulated time column shows how long the alarm has been set to the trigger value.

- For bit-triggered alarms, the accumulated time column shows how long the bit has been set to 1.
- For LSBit-triggered alarms, the accumulated time column shows how long the corresponding alarm's least significant bit has been set to 1.
- If you set up alarm messages in multiple languages, all messages and trigger labels are shown in the current application language, regardless of what language they were originally logged in.

What happens when the display is opened

- The first time a display containing the alarm status list is opened, the first page of alarms is shown.
- If the list is set up to show active alarms only, and alarms that were visible when the display was closed are no longer active, the alarms are removed from the list.
- If alarms have been reset since the display was last opened, the first page of alarms is shown.

Use buttons with the alarm history and alarm objects

Alarm buttons

You can use these alarm buttons to interact with the alarm list, alarm banner, or alarm status list, and to clear and sort the alarm history:

Use this button	With this graphic object	To do this
Acknowledge alarm	Alarm list Alarm banner	Acknowledge and silence the selected alarm.
Acknowledge all alarms		Acknowledge and silence all currently unacknowledged alarms, or the currently unacknowledged alarms for a specific alarm trigger.
Alarm status mode	Alarm status list	Change the type of alarms shown in the alarm status list, from all alarms to active alarms to past alarms.
Clear alarm banner	Alarm banner	Clear the alarm in the alarm banner without removing the alarm from the alarm log file and alarm lists.

Use this button	With this graphic object	To do this
Clear alarm history		Remove alarms from the alarm log file and all alarm lists. If the **Ack connection** is assigned for any of the alarm triggers, the operator is prompted to acknowledge all alarms before clearing them. You can set up the button to remove all alarms, or just the alarms for a specific alarm trigger. You can also specify whether to reset the cleared alarms. If you choose to reset alarms, pressing this button resets the number of times an alarm has been triggered to 0, and the accumulated time in alarm to 0, for all alarms that are being cleared. If the alarm is still active, the number of times in alarm changes to 1 after the alarm is reset to 0.
Print alarm history		Print a report of the alarm messages in the alarm log file. You can include all alarms, or just the alarms for a specific alarm trigger. The report can include the time alarms occurred and were acknowledged.
Print alarm status		Print a report of the status of alarms. You can include all alarms, or just the alarms for a specific alarm trigger. The report can include how many times each alarm was triggered, and the accumulated time in alarm.
Reset alarm status		Reset the number of times an alarm has been triggered to 0, and the accumulated time in alarm to 0, for all alarms. If the alarm is still active, the number changes to 1.
Silence alarms		Silence the audio indictor for all alarms (for applications that will run on a personal computer only).
Sort alarms		Toggle between sorting alarms in alarm lists and the alarm log file by time and by trigger value.

You can assign any caption you choose to the labels on the alarm buttons.

Link alarm buttons to objects

You can link the acknowledge alarm button to a specific alarm list or alarm banner, or set up the button to work with whichever alarm list or alarm banner is selected in the graphic display.

Similarly, you can link the clear alarm banner button to a specific alarm banner. This option is useful if you have multiple alarm banners in the same graphic display. And you can link the alarm status mode button to a specific alarm status list.

For more information about linking buttons to objects, see Link buttons to objects on page 397.

Key buttons

You can also use these key button graphic objects to interact with the alarm list, alarm status list, or alarm banner:

This button	Does this
Move up	Scrolls up one row in the list.
Move down	Scrolls down one row in the list.
Page up	Moves the highlight bar or cursor up one page in the list.
Page down	Moves the highlight bar or cursor down one page in the list.
Home	Moves the highlight bar or cursor to the top alarm in the list.
End	Moves the highlight bar or cursor to the bottom alarm in the list.
Enter	Acknowledges the currently selected alarm (in alarm lists and alarm banners).

You can link key buttons to a specific alarm object, or set up the buttons to work with whichever object is selected in the graphic display. For more information, see Link buttons to objects on page 397.

For information about creating graphic objects, see Use graphic objects on page 331. For information about setting up key buttons, see Help.

Use alarm buttons to acknowledge, silence, clear, and delete alarms

Acknowledging messages does not remove them from the alarm log file. You can still show acknowledged alarms in an alarm list that is set up to show acknowledged alarms.

Acknowledge the selected alarm

When the operator presses the acknowledge alarm button, an enter button, or the **Enter** key on an external keyboard or keypad:

- The selected alarm in the alarm list is acknowledged and the audio indicator for the alarm, if any, is silenced.

- The shown alarm in the alarm banner is acknowledged and the audio indicator for the alarm, if any, is silenced.

This is what happens when the alarm is acknowledged:

- If assigned, the alarm trigger's **Ack connection** is set to the alarm trigger value at the data source. The value is held as long as the operator presses the button, or for the hold time, whichever is longer.

  If the hold time is still in effect and the operator acknowledges a new instance of the same alarm, the new acknowledgement is ignored.

- If the alarm list is set up to show unacknowledged alarms only, the alarm is removed from the list. The highlight bar or cursor moves up to the next unacknowledged alarm, unless it is already on the top unacknowledged alarm.
- If the highlight bar or cursor is on an acknowledged alarm when the operator presses the acknowledge alarm button, the button press is ignored.
- The alarm is removed from the alarm banner.

Acknowledge all alarms

When the operator presses an acknowledge all alarms button, all unacknowledged alarms in the system (or, optionally, for a specific alarm trigger), are acknowledged.

This is what happens when the alarms are acknowledged:

- For each alarm trigger, to which an **Acknowledge all** value is assigned, the specified **Acknowledge all** value is sent to the trigger's **Ack connection**. The value is held as long as the operator presses the button, or for the hold time, whichever is longer. Then the connection's value is reset to 0.

  If the **Acknowledge all** value is not assigned for a trigger, no value is sent to the trigger's **Ack connection**.

  If the hold time for any alarm is still in effect and the operator presses acknowledge all alarms, the button press is ignored.

- If the alarm list is set up to display unacknowledged alarms only, all acknowledged alarms are removed from the list.
- The alarm banner is cleared.

Silence alarms

When the operator presses the silence alarms button, any audible signal triggered by an alarm is silenced and the **Silence** connection is set to 1 for the hold time or for the duration of the button press, whichever is longer. Then the connection's value is reset to 0.

If the hold time for any alarm is still in effect and the operator presses silence alarms, the button press is ignored.

The audio alarm indicator is available for applications running on personal computers only.

Clear and delete messages

From the alarm history

When the operator presses the clear alarm history button, all alarms in the system (or, optionally, for a specific alarm trigger) are deleted from the alarm log file and from all alarm lists. For information about the alarm log file, see The alarm log file on page 129.

If the **Ack** connection is assigned for any of the alarm triggers being cleared, the operator is prompted to acknowledge the unacknowledged messages before deleting them. If the operator chooses to acknowledge the alarms, the **Acknowledge all** value (if any) is sent to the **Ack** connection before deleting the messages. If the **Ack** connection is not assigned, or if the operator chooses not to acknowledge alarms, all messages are deleted immediately.

From the alarm banner

When the operator presses the clear alarm banner button, the shown alarm is cleared from the banner. The alarm remains in the alarm log file and in all alarm lists it appears in.

Use alarm buttons to sort alarms and reset alarm status

Sort alarms

When the operator presses the sort alarms button, the sort order toggles from time to trigger value or from trigger value to time. The sort order applies to all alarms in all alarm lists and in the alarm log file.

Reset alarm status

When the operator presses the reset alarm status button, the alarm status of each alarm is reset as follows:

- The accumulated time an alarm has been in alarm is reset to 0. If the alarm is still active, the time begins accumulating again.
- The number of times the alarm has been triggered is reset to 0. If the alarm is still active, the number changes to 1.

If the Status Reset connection is assigned (in the **Alarm Setup** editor), it is set to 1 for the hold time or for the duration of the button press, whichever is longer. If a hold time from a previous reset alarm status button press is still in effect, the button press is ignored.

Pressing the clear alarm history button can also reset the status of alarms, if you select the **Reset alarm status** option for the button. You can set the button up to clear and reset the status of all alarms, or just the alarms for a specific alarm trigger.

Retain alarm status

The status of alarms is retained when the application is shut down. When the application is restarted:

- If an alarm is still active, the time begins accumulating again.
- If an alarm is still active, the number of times the alarm has been triggered is increased by 1.

Change the alarm status shown in the alarm status list

When the operator presses the alarm status mode button, the type of alarms shown in the alarm status list changes as follows:

- If the current type shown is all alarms, the list changes to show active alarms only.
- If the current type shown is active alarms, the list changes to show past alarms only.
- If the current type shown is past alarms, the list changes to show all alarms.

The change affects the linked or selected alarm status list only, not all alarm status lists.

Set up FactoryTalk Diagnostics

This chapter describes:

- FactoryTalk Diagnostics
- Show diagnostics messages during application development
- View FactoryTalk Diagnostics log files
- Use the Diagnostics Setup tool
- Show and print diagnostics messages at run time
- The [DIAGNOSTICS] display
- Create your own diagnostics display
- Open and close the diagnostics display
- How the diagnostics list graphic object works

About FactoryTalk Diagnostics

FactoryTalk Diagnostics records information about various types of system activity, including:

- Macro usage
- Operator comments
- System messages and errors
- Errors from the communication network
- Tag read and write activity

Browse diagnostics messages

You can view diagnostics messages about system activity during application development and at run time. For example, while you develop your application, use diagnostics messages to track what the system is doing and to ensure you have set things up the way you intend. At run time, use diagnostics messages to show the operator messages about system activity. You can also save information in a log file for future processing or analysis.

How to set up FactoryTalk Diagnostics

You must set up FactoryTalk Diagnostics on both the development computer and the runtime computer. The settings for FactoryTalk Diagnostics apply to all Rockwell Automation products installed on the computer.

Set up FactoryTalk Diagnostics involves:

- Set up destinations, where logged information is received for storage or display.
- Set up which destinations receive which categories of messages. This is called message routing.
- Set up how messages are shown and printed at run time.

This chapter describes how to set up FactoryTalk Diagnostics on personal computers. For information about setting up FactoryTalk Diagnostics on the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, see the *PanelView Plus Terminals User Manual*.

Destinations

FactoryTalk Diagnostics allows you to send diagnostics messages to multiple destinations.

During application development

During application development, you can send diagnostics messages to:

- The **Diagnostics List** at the bottom of the FactoryTalk View Studio window.
- A local log, which is viewable using the FactoryTalk Diagnostics Viewer tool.
- An ODBC database.

At run time

At run time, you can send diagnostics messages to:

- Diagnostics list graphic objects, either in the default [DIAGNOSTICS] display, or in a display you create.
- A printer
- A local log (available on personal computers only), which is viewable using the FactoryTalk Diagnostics Viewer.

- A remote log (PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminals only).
- An ODBC database.

The FactoryTalk Diagnostics Viewer is available on personal computers only. However, if you send diagnostics messages from a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal to a personal computer, you can view the messages in the FactoryTalk Diagnostics Viewer.

Note: The destinations available on your computer might vary, depending on which Rockwell Automation products you have installed.

Message routing

You can decide which destinations receive which kinds of messages. This allows you to make the right information available to the right person, in the right place.

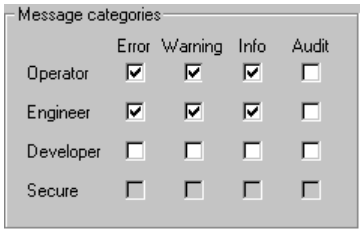
For example:

- You can send messages that contain information about what the system is doing to the local log file. You can also send warnings about things that might go wrong if left unattended to the local log file.

  This allows a control systems engineer to analyze system activity and performance, and make corrections during scheduled maintenance times.
- You can send errors that require immediate action to the diagnostics list object in the [DIAGNOSTICS] display, as well as the log file.
- You can set up the [DIAGNOSTICS] display to open automatically when system activity occurs, to allow the operator to respond to problems that might stop production if they are not solved immediately.

Categories

FactoryTalk Diagnostics categorizes messages by severity, and by audience. For each destination, you can specify the message severity and audience.



Choose not to log messages

If messages of a particular category are not routed to any destination, the messages for that category are not logged. For example, you might not want to log information messages, or you might not want to send any messages to the Operator.

Message severities

FactoryTalk View categorizes messages in four severities:

- Errors indicate that a process or action has failed. For example, a tag's value could not be written, or a user typed the wrong password while logging on to the system.
- Warnings indicate that a process or action might not function correctly, or might eventually fail if preventive action isn't taken. For example, if an ActiveX® control used in a graphic display is a different version than the one installed on the runtime computer, a warning is logged to indicate the mismatch. Mismatched ActiveX controls might not behave as expected at run time.
- Information indicates that a process or action has completed successfully. For example, a user logged on to the system or a tag value has been written to the data source.
- Audit indicates that the system configuration has been changed. FactoryTalk View records the creation, modification, and deletion of components (such as graphic displays) as audit messages.

  Other Rockwell Automation products also use audit messages. For example, if you set up an audit log in FactoryTalk AssetCentre, FactoryTalk View's audit messages will be sent there, as well as to FactoryTalk Diagnostics.

In the FactoryTalk Diagnostics Viewer, the message severity is shown in the **Severity** column, indicated by the ! symbol.

The content of the messages is provided by the system. You do not need to do anything to set up message content.

Audiences

FactoryTalk Diagnostics allows messages to be categorized differently for the various people for whom the messages are relevant. You can sort the messages in the FactoryTalk Diagnostics Viewer, so that those relevant to a particular person are grouped together.

Who receives which messages?

You can specify which types of messages are sent to the Operator, Engineer, and Developer audiences.

FactoryTalk View automatically sends audit messages to the Engineer and Secure audiences. Audit messages allow auditing tools, such as those required for US Government 21CFR Part 11 compliance, to track system activity.

Show diagnostics messages during application development

During application development, diagnostics messages are shown as you create, modify, and delete components, and when you test your graphic displays. The messages are shown in the **Diagnostics List** at the bottom of the FactoryTalk View Studio window. You can also view the messages in the FactoryTalk Diagnostics Viewer, as described in the next section.

By default, all warning and error messages are shown in the **Diagnostics List**. To change what is shown in the **Diagnostics List**, use the Diagnostics Setup tool, as described on Use the Diagnostics Setup tool on page 166.

For information about testing graphic displays, see Test your displays as you work on page 308.

To show the Diagnostics List

- From the **View** menu, select **Diagnostics List**. A check mark beside the menu item indicates the **Diagnostics List** is shown.

For information about moving, resizing, and clearing messages in the **Diagnostics List**, see The Diagnostics List on page 43.

If you don’t want to show diagnostics messages

From the **View** menu, select **Diagnostics List**. The option is turned off when no check mark appears.

View FactoryTalk Diagnostics log files

Use the FactoryTalk Diagnostics Viewer tool to view the contents of FactoryTalk Diagnostics local log files. You can open the FactoryTalk Diagnostics Viewer from within FactoryTalk View Studio, or from the Windows Start menu.

The FactoryTalk Diagnostics Viewer is available on personal computers.

You can also set up personal computers to accept messages from PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminals, and then show the messages in the FactoryTalk Diagnostics Viewer or in the **Diagnostics List**. For information about sending messages from PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminals to personal computers, see Receive messages from a PanelView Plus 7, PanelView Plus 6, PanelView Plus, or PanelView Plus CE terminal on page 168.

To open the FactoryTalk Diagnostics Viewer, do one of the following

- In FactoryTalk View Studio, from the **Tools** menu, select **Diagnostics Viewer**.
- From the Windows Start menu, select **Programs > Rockwell Software > FactoryTalk Tools** > **Diagnostics Viewer**.

For information about setting up FactoryTalk Diagnostics to send messages to the local log, see Help for the Diagnostics Setup tool. For additional information about setting up and using the FactoryTalk Diagnostics Viewer, see the FactoryTalk Diagnostics Viewer Help.

Use the Diagnostics Setup tool

Use the Diagnostics Setup tool to set up:

- Destinations and message routing on the development computer, including logging to the local log or to an ODBC database.
- Destinations and message routing on personal computers, including runtime logging to the local log or to an ODBC database.
- The Windows CE runtime destination to receive logged messages from.

You can also use the Diagnostics Setup tool to clear the local log file.

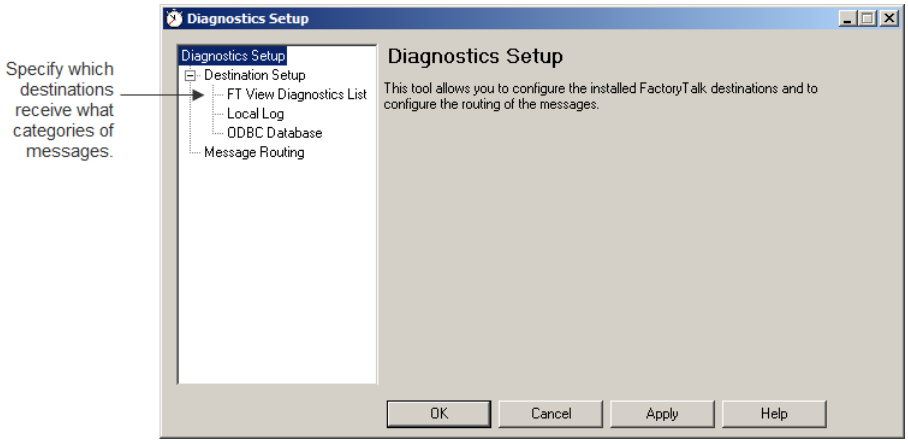
To open the FactoryTalk Diagnostics Setup tool, do one of the following

- In FactoryTalk View Studio, from the **Tools** menu, select **Diagnostics Setup**.

- In the **FactoryTalk View ME Station** dialog box, click **Terminal Settings**, and then double-click **Diagnostics Setup**.

  For information about opening the **FactoryTalk View ME Station** dialog box:

  - On personal computers, see To start FactoryTalk View ME Station on page 232.
  - On a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, see To start FactoryTalk View ME Station on a PanelView Plus 7 or PanelView Plus 6 terminal on page 250.
  - From the Windows Start menu, select **Programs > Rockwell Software > Utilities > Diagnostics Setup**.



For details about using the Diagnostics Setup tool, see Help for the tool.

Log to an ODBC database

The option of logging FactoryTalk Diagnostics messages to an ODBC database is available for personal computers only.

ODBC logging works by periodically exporting the contents of the local log file to an ODBC-compliant database. FactoryTalk View supports these ODBC-compliant databases:

- Microsoft Access
- Sybase SQL Server
- Oracle
- Microsoft SQL Server

If you have set up FactoryTalk Diagnostics to overwrite events in the local log file, make sure messages are logged to the ODBC-compliant database before the oldest events are deleted.

For information about the contents of the FactoryTalk Diagnostics ODBC tables, see ODBC database schema on page 595.

Set up message buffering

FactoryTalk Diagnostics messages are stored in the computer's local log file, and are exported to the ODBC-compliant database at the interval you specify.

You can also specify that messages remain in the local log file for a period of time after they have been exported to the ODBC-compliant database. This is useful in the event of a network failure, or any other reason that causes the database to be unavailable. In this case, the messages remain in the local log file until the buffer time expires. If the ODBC-compliant database becomes available during that time, the buffered messages are then exported to the database.

Route messages

For each destination you set up, you can specify how messages are routed.

To route messages

You need specify:

- The types of messages to log
- The audiences to send the messages to
- Whether to accept messages from Windows CE devices

For information about who receives which types of messages, see Who receives which messages? on page 165.

Receive messages from a PanelView Plus 7, PanelView Plus 6, PanelView Plus, or PanelView Plus CE terminal

You can set up FactoryTalk Diagnostics to receive messages that are generated on the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal at run time. The terminal must be on the same network as the computer running FactoryTalk Diagnostics.

To receive messages:

- Enable the personal computer to receive the messages. For details see Help for the Diagnostics Setup tool.
- Set up the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal to send the messages.

For information about setting up a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal to log to the personal computer, see the *PanelView Plus Terminals User Manual*.

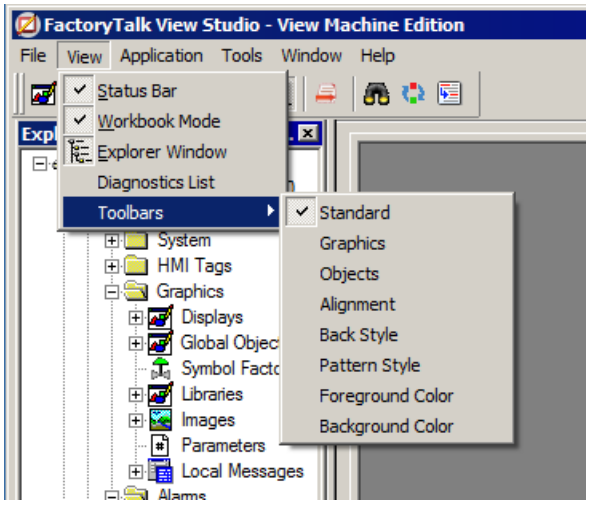
Show and print diagnostics messages at run time

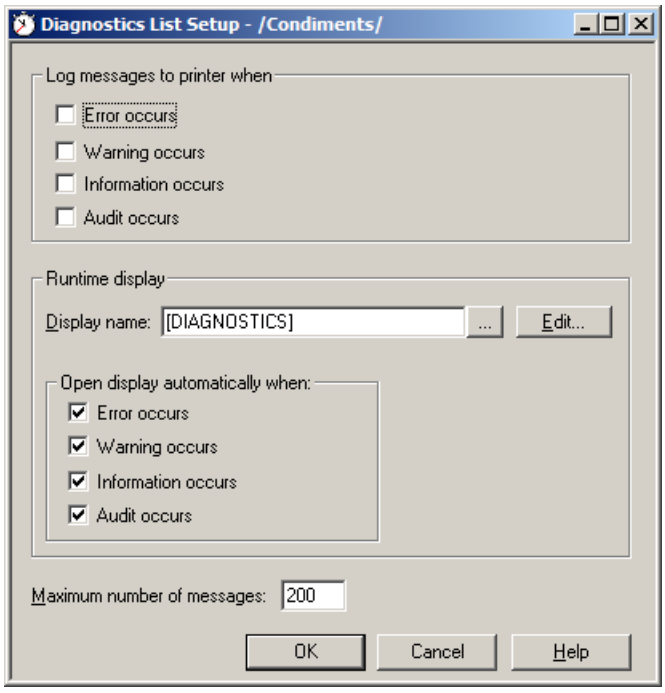
At run time, you can show diagnostics messages in a graphic display. You can also print the messages.

Use the Diagnostics List Setup editor

Use the **Diagnostics List Setup** editor to set up when to print and show messages at run time in FactoryTalk View ME Station.

The **Diagnostics List Setup** editor is located on the application tree under the System folder. Double-click on **Diagnostics List Setup** to open the editor.





For details about using the **Diagnostics List Setup** editor, see Help.

Printed messages list the date and time, the category of system activity, and the message text. By default, messages are not printed at run time.

By default, your application is set up to show diagnostics messages automatically at run time. If you want to use the default settings, you don't need to do anything further to set up diagnostics messages for print and display in FactoryTalk View ME Station.

The messages that are printed and shown depend on how you set up FactoryTalk Diagnostics on the runtime computer:

- For applications running on personal computers, use the Diagnostics Setup tool to set up diagnostics message logging. For information about using the Diagnostics Setup tool, see Help.
- For information about setting up FactoryTalk Diagnostics on the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, see the *PanelView Plus Terminals User Manual*.

For applications running on personal computers, you can also view the runtime messages in the FactoryTalk Diagnostics Viewer, as described on View FactoryTalk Diagnostics log files on page 166.

If you don't want to show diagnostics messages in FactoryTalk View ME Station

In FactoryTalk View Studio, in the **Diagnostics List Setup** editor, clear the **Display name** box, or clear the four **Open display automatically when** boxes.

Set up how messages are shown and printed at run time

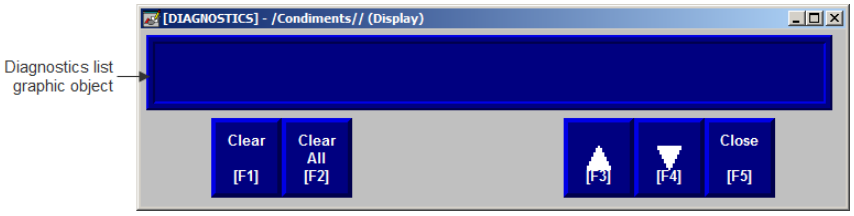
Follow these steps to set up how diagnostics messages are shown at run time:

1. In FactoryTalk View Studio, in the **Diagnostics List Setup** editor, specify which messages to print, the graphic display to use, when to open the graphic display, and the maximum number of messages to store.
2. If desired, modify the default [DIAGNOSTICS] display, or create your own graphic display to use for diagnostics messages. For example, if you don't want the operator to clear all messages at once, edit the default display to remove the clear all button.

   For information about graphic displays, see Use graphic displays on page 299.

The [DIAGNOSTICS] display

When you create an application, it comes with a graphic display called [DIAGNOSTICS]. The [DIAGNOSTICS] display is the default display for showing diagnostics messages at run time.



You can use the [DIAGNOSTICS] display as is, or modify the display. For example, you can change the color of the objects, or add and remove buttons. Or, you can create your own graphic display to use for showing diagnostics messages. In the **Diagnostics List Setup** editor, specify the display to use.

The diagnostics list graphic object

The [DIAGNOSTICS] display contains a diagnostics list graphic object, which lists the diagnostics messages. For more information about the diagnostics list, see How the diagnostics list graphic object works on page 173.

Buttons in the [DIAGNOSTICS] display

The [DIAGNOSTICS] display contains diagnostics list buttons for clearing the messages, as well as buttons for scrolling the list and closing the display. For information about how the buttons work, see Use buttons with the diagnostics list on page 173.

Create your own diagnostics display

You can create your own graphic display for showing diagnostics messages, containing a diagnostics list graphic object and the buttons the operator needs for using the display.

If you create your own graphic display, use an On Top display and select the **Cannot Be Replaced** option.

For more information about the diagnostics list, see How the diagnostics list graphic object works on page 173. For information about the buttons you can use with the list, see Use buttons with the diagnostics list on page 173. For information about creating graphic displays and graphic objects, see Use graphic displays on page 299 and Use graphic objects on page 331.

Open and close the diagnostics display

Open the display

The diagnostics display you specify in the **Diagnostics List Setup** editor

(either the default [DIAGNOSTICS] display or a display you create) is automatically opened whenever a diagnostics message of the specified severity occurs.

The display remains open until the operator closes the display.

If you decide not to open the diagnostics display automatically, you can create a Goto display button that the operator can press to open the diagnostics display. For information about setting up a Goto display button and specifying the display to open, see Help.

Close the display

The operator can close the display by pressing a close display button.

How the diagnostics list graphic object works

At run time, when a severity of system activity occurs that you set up to log, a message about the activity is added to the diagnostics list. The diagnostics list can be in the [DIAGNOSTICS] display, in a diagnostics display you have created, or can be placed on any display in your application.

You can use multiple diagnostics lists, in the same display or in different displays. Each diagnostics list shows the same information.

For information about setting up diagnostics lists, see Help.

What is shown

- If the message is too long to fit in the list, the last shown character is replaced with an asterisk (*).
- The number of diagnostics messages that is visible at one time depends on the height of the diagnostics list and the list's font size.
- Messages are listed with the newest diagnostics message on top.

Use buttons with the diagnostics list

Diagnostics buttons

You can use these diagnostics buttons to interact with the diagnostics list:

This button	Does this
Diagnostics clear	Clears the selected message from all diagnostics lists in the application.
Diagnostics clear all	Clears all diagnostics messages from all diagnostics lists in the application.

You can assign any captions you choose to the labels on the diagnostics buttons.

You can link the diagnostics clear button to a specific diagnostics list. When the operator presses the button, the selected message is deleted from the linked diagnostics list, and also from any other diagnostics lists in the application. For information about linking buttons to objects, see Link buttons to objects on page 397.

Key buttons

You can also use these key button graphic objects to interact with the diagnostics list:

This button	Does this
Move up	Scrolls up one row in the list.
Move down	Scrolls down one row in the list.
Page up	Moves the highlight up one page in the list.
Move left	Moves the message six characters to the right so you can see more characters on the left.
Move right	Moves the message six characters to the left so you can see more characters on the right.
Page down	Moves the highlight down one page in the list.
Home	Moves the highlight to the top message in the list.
End	Moves the highlight to the bottom message in the list.

You can set up the key buttons to work only with the specified diagnostics list, or to work with whichever object is selected in the graphic display. For information about linking buttons to objects, see Link buttons to objects on page 397.

For information about creating graphic objects, see Use graphic objects on page 331. For information about setting up specific buttons, see Help.

Set up security

This chapter describes:

- Use FactoryTalk Security to add users and groups accounts
- Use the **Runtime Security** editor
- Configure displays to control runtime operator access
- Provide a way for users to log in and log out
- Set up FactoryTalk Security in FactoryTalk View Studio
- Configure user accounts policies
- Examples of how to configure applications to use FactoryTalk View security features

Use security with your application

FactoryTalk View and FactoryTalk Security work together to provide secure access to applications during development and at run time. FactoryTalk Security is installed as part of the FactoryTalk Services Platform, and uses FactoryTalk Directory to manage user accounts and policies.

Starting with FactoryTalk View ME 8.00.00, FactoryTalk security applies to the open application only. Users and groups are saved with the project and are not shared with other projects.

You can use a combination of FactoryTalk Security and FactoryTalk View security features at run time to:

- Prevent unauthorized users from running the application.
- Prevent users from opening graphic displays.
- Prevent unauthorized users from stopping the application.
- Prevent users from seeing and using certain parts of a graphic display.
- Prevent users from switching to other applications. This feature uses the DeskLock tool, and is available for personal computers only. You can use this tool to set up a customized desktop and to prevent access to Windows functions. For more information about the DeskLock tool, see Run applications on a personal computer on page 229. The DeskLock tool does not use FactoryTalk Security.

To limit the users who have access to the application or parts of the application, you must set up user accounts and passwords.

If you set up the data source to open graphic displays remotely (using global connections), remote display changes occur whether or not the logged-in user has security access to a given display.

For details about controlling display changes remotely, see Control display changes remotely on page 114.

Note: The Authenticated User group is not supported on Windows CE. On Windows CE terminals, Windows-linked users must be added to FactoryTalk Directory before they can be logged in.

If you do not create additional FactoryTalk View user accounts

FactoryTalk View creates a user named DEFAULT, and this user is automatically logged in when you start applications at run time. You do not need to set up any other users, and users do not need to log in to use the applications you create.

If you use FactoryTalk View user accounts

If you want to use FactoryTalk View user accounts, for example, to run login and logout macros, follow these steps.

1. Add users or user groups to FactoryTalk Security.
2. Add the FactoryTalk Security users or user groups to the **FactoryTalk View Runtime Security** editor. For details, see To add FactoryTalk Security users and groups to FactoryTalk View and assign security codes to them on page 180.
3. In the **FactoryTalk View Runtime Security** editor, if desired, assign login and logout macros and security codes to users or user groups. For details, see Help for the editor.
4. In the **Graphics** editor, assign security codes to graphic displays that will have limited access. An alternative is to use object animation to control visibility based on the logged in user's **FactoryTalk View Runtime Security** security codes.
5. Provide users with a method for logging in and out.

These steps are described in detail in this chapter.

Steps for setting up security

Follow these steps to set up security using FactoryTalk Security and FactoryTalk View security features:

1. In the Explorer window, in the System folder underneath the HMI server, add FactoryTalk Security user groups and users, and set up their passwords.

   You can also add users and groups in the **Runtime Security** editor, in the **ME Runtime 4.00 and later** tab, as described in To add FactoryTalk Security users and groups to FactoryTalk View and assign security codes to them on page 180.

2. In the **Runtime Security** editor, add FactoryTalk Security users or user groups to FactoryTalk View, and assign login and logout macros and security codes to them.

3. In the **Graphics** editor, assign security codes to graphic displays that will have limited access.

4. Provide users with a method for logging in and out.

5. If desired, prevent unauthorized users from stopping the application.

6. Set up policies for passwords and user accounts.

These steps are described in detail in the following sections.

You can also assign security to action groups, connections, and databases. These topics are not discussed in this chapter. For information about these topics, see the FactoryTalk Security help.

Create FactoryTalk Security users

You can set up users in FactoryTalk Security before you add them to the **FactoryTalk View Runtime Security** editor.

FactoryTalk Security allows you to reference user accounts that have already been set up in Windows. These are called Windows-linked users. The link symbol in the Explorer window indicates that a user is a Windows-linked user.

To set up users

1. In the System folder, right-click **Users**, and then select **New User** or **New Windows-Linked User.**

2. Specify the user name, password, and password options. For details, see Help.

3. To add users to a group, right-click the group and then select **Properties**. For details, see Help.

To change user passwords

1. In the Users folder, right-click the user name, and then select **Properties**.

2. Click **Reset Password**. For details, see Help.

Users can change their password at run time using the **Password** button. For more information, see Change passwords on page 267.

Users can also change their properties at run time using the **Change User Properties** button. For more information, see Enable a user on page 277.

Create FactoryTalk Security user groups

The use of user groups is optional but recommended. Groups allow you to set up security access once for the entire group, rather than individually for members of the group. You can still set up separate permissions for individual members of the group.

Note: Setting up groups saves time. You can add all the users of an application to a single group in **FactoryTalk Security**, then add the group to the **FactoryTalk View Runtime Security** editor in one step, which is much quicker than adding the users one by one.

FactoryTalk Security allows you to use groups that have already been set up in Windows. These are called Windows-linked groups. The link symbol in the Explorer window indicates that a group is a Windows-linked group.

FactoryTalk Security comes with an Administrators group already set up. The local computers Windows Administrators group is automatically added to this FactoryTalk Security group. To start with, members of this group have full security access to **FactoryTalk Security**, and therefore have full access to your applications.

To ensure that you are never locked out of FactoryTalk Directory we recommend that you assign more than one user to the Administrators group. If one user is locked out, you can use the other one to log in.

To set up user groups

1. In the System folder, right-click User Groups, and then select **New User Group** or **New Windows-Linked User Group**.

2. Add user groups. You can add members to the groups now or later. For details, see Help.

3. To add members to the group later, right-click the group and then select **Properties**. For details, see Help.

To add user accounts to the group

1. In the **System/Users and Groups/User Groups** folder, double-click a user group.

2. In the **Properties** dialog box, click **Add**.

3. In the **Select User or Group** dialog box, select the user accounts you wan to be members of the group, and then click **OK**.

Work with the Runtime Security editor

Use the **Runtime Security** editor to:

- Add FactoryTalk Security users and assign security codes and login and logout macros, for each user or group of users that will have access to the application at run time.
- Migrate users from RSView version 3.20 and earlier to FactoryTalk View version 4.00 or later.
- Assign user passwords (version 3.20 and earlier applications only).
- Add Windows users or groups (version 3.20 and earlier applications only).

The method for adding users and assigning security codes to them depends on whether you are setting up users for FactoryTalk View 4.00 applications, or for RSView 3.20 and earlier applications. There is a separate tab for 4.00 and later applications and for 3.20 and earlier applications.

The **Runtime Security** editor has special items on the **View** menu to control the appearance of the editor. It also has items on the **Setup** menu, and extra tools on the toolbar.

How user accounts and security codes work

When you assign a security code to a graphic display, only the users and groups who are assigned that security code have access to the display. There are 16 security codes, A through P.

The asterisk symbol (*) is used in displays and represents any code. Users must have at least one code assigned to open displays that use the * code.

You can assign combinations of security codes to users and groups, to allow each user or group access to a different set of displays or graphic objects.

To use security codes to restrict user access to graphic objects, assign visibility animation to the objects using expressions containing the security functions. For an example, see Application examples on page 187.

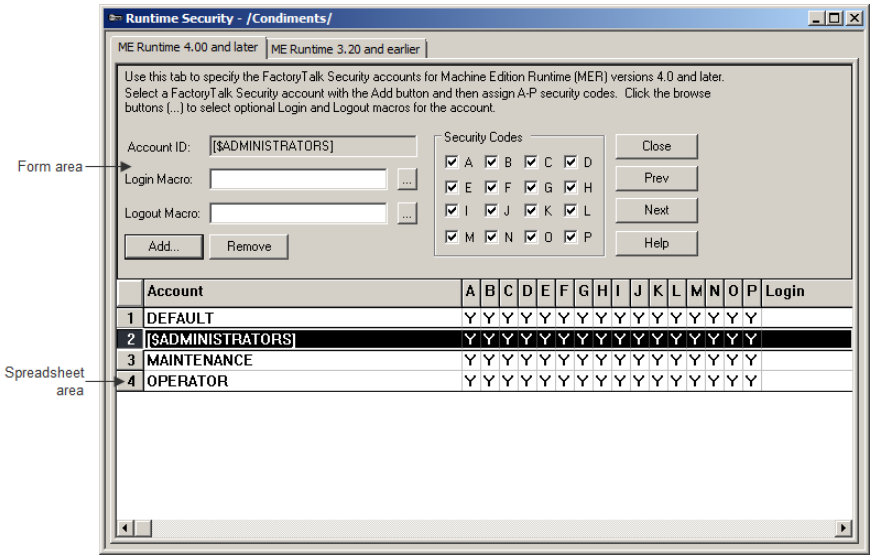
The DEFAULT user

The first account in the editor is the DEFAULT user account. The DEFAULT account is used when no one is logged in. The DEFAULT user initially has access to each security code. Unless you want everyone to have access to all parts of the application at run time without logging in, turn off the DEFAULT user's access to the security codes you plan to use.

You cannot delete the DEFAULT user account.

Note: Assign the security code for the startup display to the DEFAULT user, or else the startup display won't open. If the startup display uses the * security code, you can assign any code from A to P to open the display. For more information, see Assign security to graphic displays on page 185.

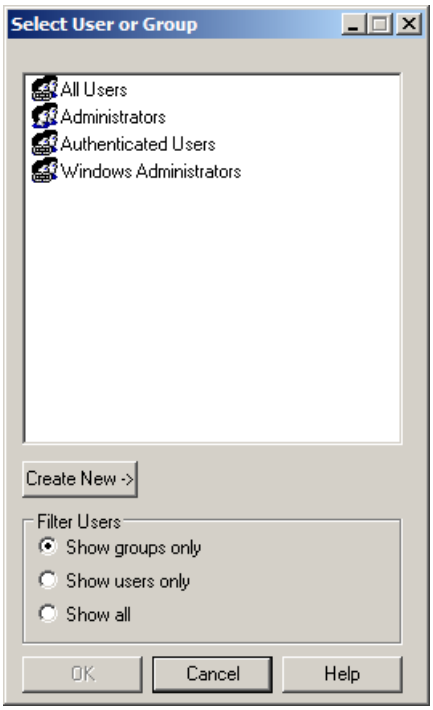
Set up users for 4.00 and later applications



To add FactoryTalk Security users and groups to FactoryTalk View and assign security codes to them

1. Open the **Runtime Security** editor and select the **ME Runtime 4.00 and later** tab.

2. Click **Add**.



3. In the **Select User or Group** dialog box, add users and groups, and select the ones to add to FactoryTalk View. You can only select one user or group at a time.

   For details on using the **Select User or Group** dialog box, see Help.

4. In the **Runtime Security** editor, assign **Login** and **Logout Macros** and **A-P Security Codes** to the users and groups.

   - **Login Macro** - *Optional*. To run a macro each time this user logs in, type the macro name in this box, or click the browse button (…) to select from a list of macros in the application.
   - **Logout Macro** - *Optional*. To run a macro each time this user logs out, type the macro name in this box or click the browse button (…) to select from a list of macros in the application. If a new user logs in before the previous user has logged out, the logout macro of the previous user runs after the new user logs in.
   - A-P Security Codes. For a new user, all the boxes are selected by default (Y is shown in all columns in the spreadsheet). To block access to a security code, clear the check box for the code in the form section.

   Be sure the DEFAULT user is allowed at least one security code, and assign the same security code (or the * code) to the initial graphic

display. If the DEFAULT user has no security codes allowed, when the application is run, no display will open.

To remove a FactoryTalk Security user or group from FactoryTalk View

1. Open the **Runtime Security** editor and select the **ME Runtime 4.00 and later** tab.
2. In the **Account** column, select a user or group, and click **Remove**.
3. Click **Yes**.

To migrate RSView 3.20 and earlier users to FactoryTalk View

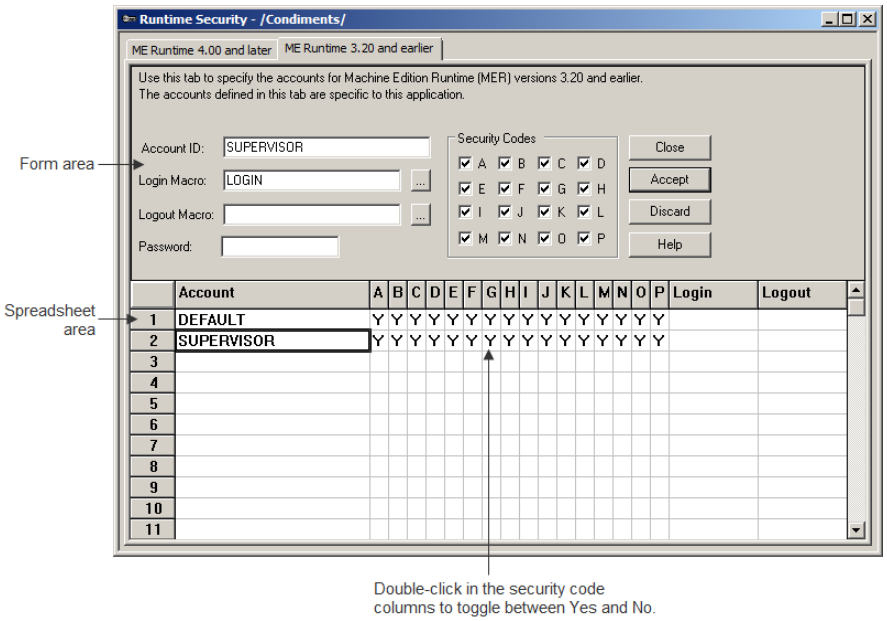
1. With the **Runtime Security** editor open and the **ME Runtime 4.00 and later** tab selected, from the **Setup** menu, select **Migrate ME Runtime 3.20 and earlier accounts**.

   Users from the **ME Runtime 3.20 and earlier** tab are added to the FactoryTalk Security Users folder and to the **ME Runtime 4.00 and later** tab.

   Note: Users are not migrated if they already exist in the ME Runtime 4.00 and later account list.

2. If desired, edit the users' security codes and login and logout macros.
3. If desired, edit the users' passwords.

Set up users for 3.20 and earlier applications



To add users to RSView 3.20 and earlier applications and assign security codes to them

1. Open the **Runtime Security** editor and click the **RSView 3.20 and earlier** tab.

2. Add users, and then assign macros, passwords, and security codes to them.

   For details about using the **Runtime Security** editor, see Help.

Change RSView 3.20 and earlier user passwords

For RSView 3.20 and earlier applications, users cannot change passwords at run time. You can only change passwords in the **Runtime Security** editor. After changing passwords, recreate the application and download the .mer file.

Add 3.20 and earlier users or groups from a Windows domain

In RSView 3.20 and earlier applications, there are two possible types of user accounts:

- Users or groups from a Windows domain

- Users you create in FactoryTalk View.

You cannot use both user account types in the application at the same time.

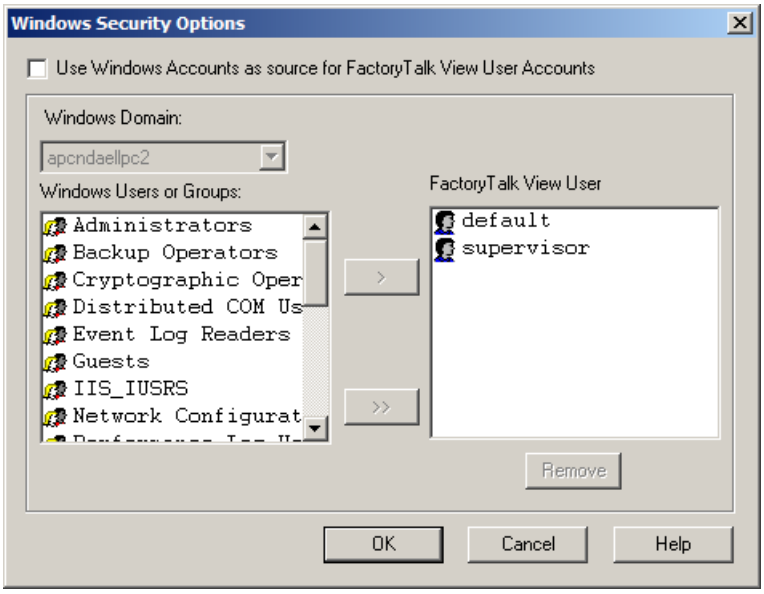
Before you can make use of Windows user accounts in FactoryTalk View, you must first create the user accounts in your Windows domain. To do this in a Windows network domain, your network must have at least one Windows server acting as a domain controller. You cannot use Windows Workgroups.

When you use Windows users or groups, the user password is the Windows domain password.

To add users from a Windows domain to FactoryTalk View

1. Open the **Runtime Security** editor, and then click the **RSView 3.20 and earlier** tab.

2. From the **Setup** menu, select **Windows Security Options**.



3. In the **Windows Security Options** dialog box, specify the users and groups to use. For details, see Help.

4. In the **Runtime Security** editor, specify login and logout macros and assign security codes to the users. For details, see Help.

   You cannot change the user or group name (Account ID) and password. To change the password, use the Windows Control Panel.

Remove 3.20 and earlier users or groups

You can also use the **Windows Security Options** dialog box to remove users or groups. When you remove a user or group from the **FactoryTalk View User** list, the user or group's name is deleted from the **FactoryTalk View Runtime Security** editor. The user or group is not deleted from the Windows domain.

If you remove users from the Windows domain, they are not removed automatically from the **FactoryTalk View Runtime Security** editor. You must remove the users from the **Runtime Security** editor manually, using the **Windows Security Options** dialog box.

Assign security to graphic displays

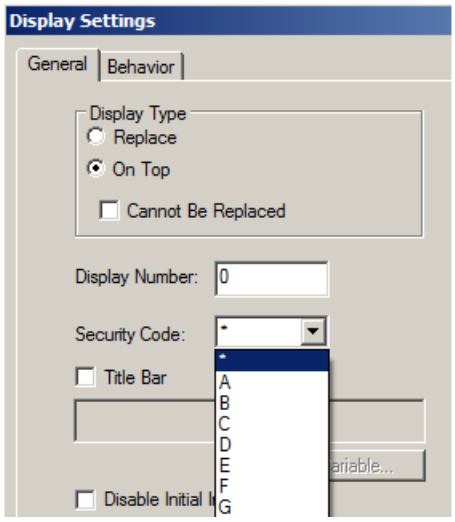
Assign security to graphic displays in the **Graphics** editor. You can:

- Assign security when you create the graphic display, or at any time after creating the display.
- Assign the same security code to more than one display.
- Assign whichever codes you want, in any order. For example, you can choose to use only the codes D and P and you can assign P before you assign D.

For more information about graphic displays, see Use graphic displays on page 299.

To assign security to a graphic display

1. In the **Graphics** editor, right-click an empty area of the display, and then select **Display Settings**.



2. In the **General** tab, select a security code.

3. To give every security code access to the display, select the asterisk (*). The * is selected by default.

Provide a way for users to log in and log out

Use Login and Logout buttons to provide a way for users to log in and log out. Make sure you place these buttons in graphic displays that all users have access to.

Log in

When the application starts, the DEFAULT user is logged in. If a macro is assigned to the DEFAULT user, the macro runs.

For example, you could create a macro to set the remote display number to open a new login display after the DEFAULT user logs in. For information about controlling display changes remotely, see Control display changes remotely on page 114. Remote display changes are not checked for security.

To provide a way for users to log in

1. Specify the startup display in the **Startup** editor, in the **Initial graphic** box. The startup display is the graphic display that opens when your application starts running.

2. The startup display must have the * code or a security code that is assigned to the DEFAULT user, or it will not open.

   For information about the **Startup** editor, see Create runtime applications on page 221.

3. Create a **Login** button in the startup display.

   For information about creating graphic objects, see Use graphic objects on page 331. For information about setting up Login buttons, see Help.

For more information about logging in, see Use your application on page 257.

Log out

When the current user logs out, if a logout macro is assigned to the user, the macro runs. If the user belongs to a group, and a logout macro is set up for the group, the logout macro runs.

After the current user is logged out, the DEFAULT user is logged in. If a login macro is assigned to the DEFAULT user, the macro runs.

You can also set up the application to automatically log out the current user after a specified period of inactivity. For more information, see Log out automatically on page 187.

To provide a way for users to log out

- Create a **Logout** button in a graphic display that all logged-in users have access to.

Log out automatically

You can set up your runtime terminal so that the current user will be logged out automatically after the terminal has been inactive for a specified period of time. The automatic logout is independent of FactoryTalk Security settings or Windows security settings. The logout will take place regardless of what you set up in FactoryTalk Security or Windows.

To set up automatic logout

1. In the Explorer window, double-click **Project Settings**, and then click the **Runtime** tab.
2. Select **Enable auto logout**.
3. Specify how many minutes the terminal must be inactive before the automatic logout occurs.
4. If desired, specify a graphic display to open after the automatic logout.

At run time, when the inactivity period expires, the current user is logged out. Logout macros assigned to the current user run. The DEFAULT user is logged in. The DEFAULT user's login macro runs. The specified graphic display opens (if any).

Application examples

Example: Assign security codes to prevent access to graphic displays

This example shows how to set up users with access to different graphic displays.

1. Assign security codes to graphic displays as follows:

To this display	Assign this security code
Alarm History	A
Boiler	B

To this display	Assign this security code
Furnace	C
Top Secret	D

2. In the **Runtime Security** editor, assign the security code P to the DEFAULT user.

3. Assign security codes for the displays they can use to the other users:

To this user	Assign these security codes
MAINTENANCE	A, B, C
OPERATOR	A, B
ADMIN	All

The users have access to these graphic displays:

- MAINTENANCE has access to the first three graphic displays.
- OPERATOR has access to the Alarm History and Boiler displays, but not to the Furnace or Top Secret displays.
- The ADMIN user has access to every graphic display.
- The DEFAULT user has access only to graphic displays to which * or P has been assigned. In this example, the DEFAULT user does not have access to any of the four graphic displays.

In this example, you could have assigned the same security code to the Alarm History and Boiler displays, since all users except the DEFAULT user have access to these displays.

Example: Use security codes to control the visibility of the shutdown button

This example shows how to set up users so that only authorized users can use the shutdown button to stop the application.

This example uses the CurrentUserHasCode security function to determine whether a user is authorized to view and use the shutdown button.

The security code E is assigned to users who are authorized to use the button.

1. In the **Runtime Security** editor, clear all the security codes for the DEFAULT user.

2. Assign security codes to the other users:

To this user	Assign these security codes
OPERATOR	A, B
MAINTENANCE	A, B, C, E
ADMIN	All

3. Create a shutdown button.
4. Assign visibility animation to the button using this expression:

   ```
   CurrentUserHasCode( E )
   ```

   For the **Expression True State**, click **Visible**.

When the graphic display containing the shutdown button is open, the MAINTENANCE and ADMIN user can see the button. If the OPERATOR or DEFAULT user is logged in, the button is not visible.

Example 3: Assign visibility animation to the Goto display button

This example shows how to assign visibility animation to the Goto display button so that a user must log in before seeing the button.

This example uses the security function CurrentUserName( ). The function returns the string value of the Account ID (user name) for the user who is currently logged in.

The CurrentUserName( ) function is case sensitive. All RSView 3.20 and earlier user names use uppercase letters.

When the application starts, the DEFAULT user is logged in. The DEFAULT user is also logged in when a user logs out.

To assign visibility animation to the Goto display button

1. Right-click the Goto display button, select **Animation > Visibility**.
2. In the **Animation** dialog box, in the **Expression** box, type this:

   ```
   CurrentUserName( ) <> "DEFAULT"
   ```

3. For the **Expression True** State, click **Visible**.
4. Click **Apply**.

Example 4: Assign visibility animation to the shutdown button

This example shows how to assign visibility animation to the shutdown button so that only the ADMIN user can stop the application.

To assign visibility animation to the shutdown button

1. Right-click the shutdown button, select **Animation > Visibility**.
2. In the **Animation** dialog box, in the **Expression** box, type this:

   ```
   CurrentUserName( ) == "ADMIN"
   ```

3. For the Expression True State, click **Visible**.
4. Click **Apply**.

Example 5: Assign visibility animation to the shutdown button

This example shows how to assign visibility animation to the shutdown button so that only users assigned code G or code H can stop the application.

To assign visibility animation to the shutdown button

1. Right-click the shutdown button, select **Animation > Visibility**.
2. In the **Animation** dialog box, in the **Expression** box, type this:

   ```
   CurrentUserHasCode(GH)
   ```

3. For the Expression True State, click **Visible**.
4. Click **Apply**.

Example 6: Prevent unauthorized users from stopping the application

To prevent unauthorized users from stopping the application

- Do not use a title bar on the application window, because the title bar contains a **Close** button. To turn off the title bar for the application window, in the **Project Settings** editor, in the **Runtime** tab, clear the **Title bar** check box.

For more information about using the **Project Settings** editor, see Work with applications on page 61.

- Assign visibility animation to the shutdown button, so that the button is only visible when a user who is authorized to stop the application is logged in. For an example, see Example: Use security codes to control the visibility of the shutdown button on page 188.

  Or, set up security for the graphic display, in which the shutdown button is located, so only users who are authorized to stop the application can open the display.

Additional step for personal computers

- Use the DeskLock tool to prevent users from having access to the Windows desktop. This will prevent access to operating system functions such as restarting Windows or shutting down tasks. For more information, see Use the DeskLock tool on page 245.

Additional step for PanelView Plus CE applications

- Hide the Windows Taskbar to make it inaccessible.

To hide the Windows Taskbar

1. From the Windows Start menu select **Settings**> **Taskbar**.
2. Clear the **Always on top** check box.
3. Select **Auto hide**.
4. When you are finished, click **OK**.
5. At the **Command** prompt or in the **Run** box, run **Regflush.exe** to save your changes to persistent internal flash memory. Otherwise, the changes will be lost when you reboot.

Set up FactoryTalk Security for your application

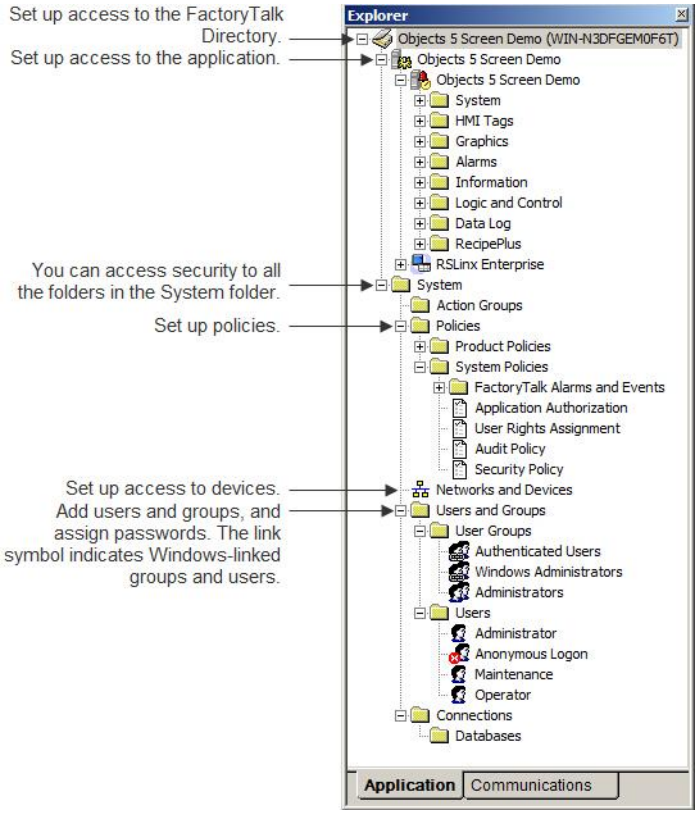
In the Explorer window of FactoryTalk View Studio you can modify additional application behaviors related to security:

- Specify the types of activities to track for audit purposes.
- Specify policies for passwords and user accounts, such as how often passwords must be changed.

FactoryTalk View Studio Explorer window can also be used to change the following security settings:

- Set up access to the application.
- Assign security access to action groups, policies, groups, and users.

When changing security access for these resources, it is important to understand how each change affects the application. For example, it is possible to prevent *any* user from accessing the project by changing these settings.



Specify activities to track for audit purposes

You can keep an audit trail of activities such as changing the setup of the FactoryTalk Directory and whether security access is denied or granted to users.

To specify which activities to track for audit purposes

1. In the System Policies folder, double-click **Audit Policy**.
2. Set up audit policies. For details, see Help.

Specify policies for passwords, accounts, and FactoryTalk sign-on

You can use the FactoryTalk Directory Security Policy to specify how to manage passwords and user accounts, including how long passwords must

be, how often they must be changed (if ever), and whether to keep a record of deleted user accounts.

Note: Remember that any changes that you make to system security policies will be included as part of the runtime application. It is therefore very strongly recommended that you do not alter the default settings in the **Security Policy Properties** dialog box unless absolutely necessary, and unless you are aware of the full implications of the changes. Always test the runtime application to make sure the results are what you intended.

Single sign-on

You can also use the Security Policy to turn off FactoryTalk single sign-on. If you turn this feature off, users must log into FactoryTalk each time FactoryTalk View Studio is restarted.

To specify how to manage passwords, user accounts, and FactoryTalk sign-on

1. In the System Policies folder, double-click **Security Policy**.
2. Set up options for accounts, passwords, and single sign-on. For details, see Help.

Uncommon security permissions

Although users can adjust the following security permissions, it is very uncommon. Care must be taken when changing these security permissions from the default settings.

Set up security access to the FactoryTalk Directory

By default, applications and the System folder inherit the security permissions assigned to the FactoryTalk Directory. This means that you only need to assign permissions to user groups or users once. If desired, you can override the permissions that you set up at this level by assigning different permissions to applications and to the items in the System folder.

You can assign permissions for actions related to FactoryTalk View applications and tags here or at the application level. If you assign them here, they are inherited by all applications.

To set security permissions for the FactoryTalk Directory

1. At the top of the tree in the Explorer window, right-click Local, and then select **Security**.

2. Specify which users and groups have access to FactoryTalk Directory, and assign permissions to users and groups for the actions listed in the dialog box. For details, see Help.

Set up security access to the application

Assign FactoryTalk Security at the application level to specify which users or groups can open the application and add, edit, and delete components. You can also specify which users or groups can write to tags and set up, view, and respond to alarms.

To set security permissions for the application

1. Right-click the application name, and then select **Security**.

2. Specify which users and groups have access to the application, and assign permissions to users and groups for the actions listed in the dialog box. For details, see Help.

Set up security access to System policies, groups, and users

You can assign security access to the System folder and to all the folders in the System folder, including policies, groups, and users. You do this by specifying which groups and users have access to the folder, and what actions they can perform.

To set up security access to policies, groups, and users

1. Right-click the System folder, or a folder in the System folder, and then select **Security**.

2. Specify which groups and users have access to the folder, and what actions they can perform. For details, see Help.

Set up security access to networks and devices

You can assign security access to networks and devices in general, to the development computer, and to specific devices. Set up security for networks and devices if you are using RSLinx Classic devices.

To set up security access to networks and devices

1. In the System folder, right-click **Networks and Devices**, the development computer workstation, or a specific device, and then select **Security**.

2. Specify which groups and users have access to the item, and what actions they can perform. For details, see Help.

Set up language switching

This chapter describes:

- What language switching is
- Summary of steps for setting up language switching
- Set up Windows to support language switching
- Add languages to the application
- Export application text strings for translation
- Translate application text
- Import translated text files
- Set up multiple language support for graphic libraries

About language switching

The FactoryTalk View language switching feature provides the ability to set up multiple languages for an application and switch languages dynamically at run time. You specify an initial language for the runtime application when you create it, and select the languages that will be available at run time. You can use up to 40 languages per development application, and 20 languages per runtime application.

When the application runs, operators can change the language using a **Language Switch** button. Set up a different **Language Switch** button for each language.

With language switching you can:

- Develop an application in one language, export the user-defined text strings for the application, and then import translated strings for up to 40 languages into the same application.
- Export an application's text strings in multiple languages into a single Microsoft Excel spreadsheet.
- Import text strings in multiple languages from a Microsoft Excel spreadsheet into your application in a single operation.
- Use the same application in different countries, allowing operators in each location to view the application in their own language.
- Allow operators in multilingual countries to use the language of their choice.

- Import application components developed in different countries into a single application that supports multiple languages.

The default language

For applications that use multiple languages, you can specify one of the languages as the default language. Any undefined text strings in the other languages can be shown in the default language.

The default language is also used for RSView Machine Edition 4.00 applications. When you open or import the application into FactoryTalk View 5.00 or later, the application's alarm, information, and local messages are associated with the language that you select to be the default language. For example, if you open an RSView Machine Edition 4.00 application that contains local messages, and you select French for the default language, the local messages will be treated as if they are French when you export the application's strings for translation. That is, they will appear in the **French language** column. You can add other languages for these messages, as described in this chapter.

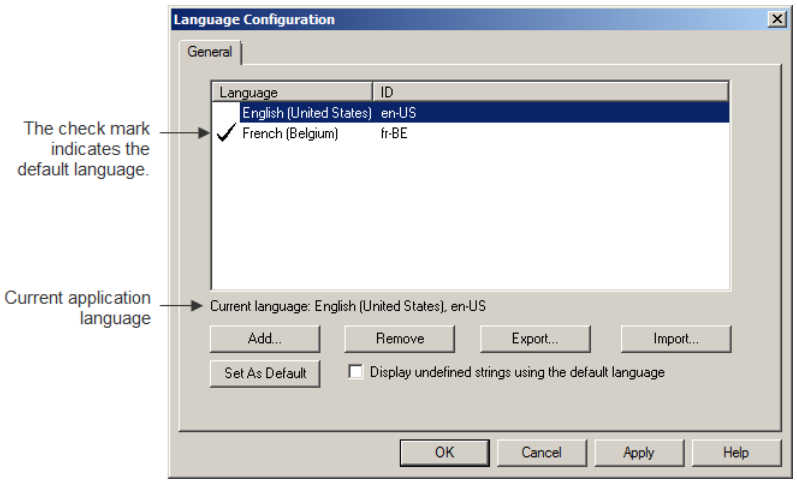
When you create a new application, the language you specify for the application is the default language. You can change the default language at any time. The default language can be any of the languages in the application.

You can show undefined strings in the default language during application development. If you do not select this option, undefined strings are shown as a question mark "?" character. If you select this option, but do not include the default language with the runtime application, undefined strings are shown as a question mark "?" character at run time.

Alarm trigger labels are shown in the Trigger Label Selector list using the default language. If you change the default language, you must re-specify the trigger labels for every graphic object that filters alarms. To do this, specify the trigger label names in the new default language. For more information about filtering alarms when your application uses multiple languages, see Filter alarm triggers in multiple languages on page 123.

To change the default language

1. From the **Tools** menu, select **Languages**.



2. Select the language to use for the default language.
3. Click **Set As Default**. A large check mark to the left of the selected language indicates that it is now the default language.
4. To use this language for all undefined strings in the application, select **Display undefined strings using the default language**.

Steps for setting up language switching

Follow these steps to set up language switching for an application:

1. For applications that will run on a personal computer, install the Windows languages that the application will use.
2. For applications that will run on a PanelView Plus or PanelView Plus CE terminal, set up the fonts that the application will use.
3. Create, open, or import the application in the language of your choice. For details, see Work with applications on page 61.
4. Add languages to the application. For details, see Add languages to the application on page 201.
5. Create graphic objects and specify the text strings that they will use.
6. Create alarm, information, and local messages.
7. Create a **Language Switch** button for each language you plan to use at run time. For details, see Help.
8. Export the application text strings for translation. For details, see Export application text strings for translation on page 202.

9. Translate the text strings. For details, see Translate application text in Unicode files on page 205.

10. Import translated text strings for each of the translation languages. For details, see Import text on page 209.

11. Open the application in each language, to check the layout of the translated text.

12. Create the runtime application, specifying the startup language and the languages that the operator can switch to. For details, see Create runtime applications on page 221.

Set up Windows for language switching

Install Windows languages

We recommend that you install all the languages that your application will use, on both the development and runtime computers. Installing languages turns on the Windows font support features, which allow applications to show characters for different languages using a single application font.

For details about installing languages, see Windows Help.

PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, and PanelView Plus CE terminals are shipped with languages already installed.

Set up Windows fonts

For applications that will run on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, install the fonts that the application will use. For applications that will run on a personal computer, the fonts you want are generally installed when you install the languages for the application. Be aware that using MS Arial Unicode as the default font provides better performance for language switching.

For details about choosing fonts that work well with language switching, see Choose fonts for language switching on page 343.

Make sure that the development and runtime computers are set up to use the fonts you want for the title bar and inactive title bar. Specify the font in the Windows Control Panel, in the **Display Properties** dialog box.

For information about setting up fonts on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, see the *PanelView Plus Terminals User Manual*.

Windows locale settings

Windows locale formatting determines how the application shows time, date, and floating point values at design time and run time.

When the application language is switched, the locale settings for the new language are used even if that language has not been installed.

You do not need to edit the default locale settings.

Add languages to the application

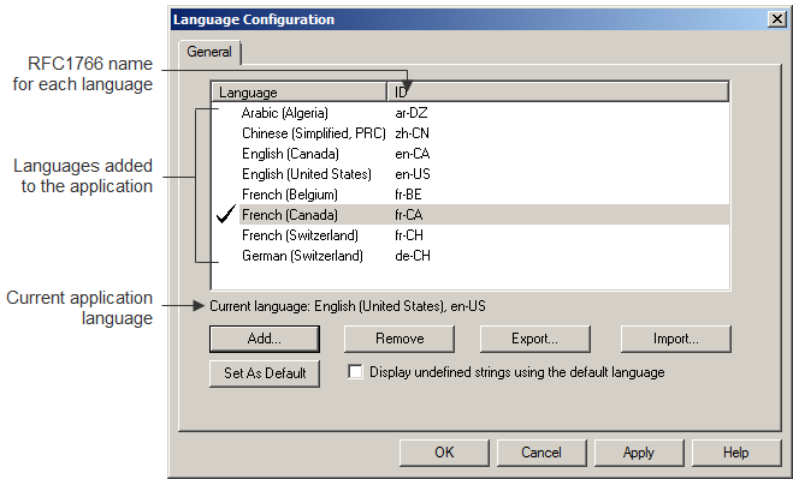
Use the **Language Configuration** dialog box in FactoryTalk View Studio to add up to 40 languages to the application.

Add languages before you:

- Create **Language Switch** buttons.
- Create the runtime application.

To add languages to an application

1. From the **Tools** menu, select **Languages**.



2. Add languages. For details, see Help.

Remove languages

You can also use the **Language Configuration** dialog box to remove languages. When you remove a language, all the strings for the language are deleted the next time you save the application. Save a component deletes strings for the removed language from the component.

Export application text strings for translation

There are two options for exporting text strings:

- One language at a time, saving the text in a tab-delimited text file in Unicode format. The file can be translated and then imported back into the application.
- All languages at once, exporting into a single Microsoft Excel spreadsheet. The strings in the spreadsheet can be translated and then imported back into the application.

These text strings allow language switching and are exported for translation:

- Display titles for On Top displays (defined in the **Display Settings** dialog box)
- Text graphic objects
- Captions that you define for graphic objects, including objects in global object displays
- Alarm, local, and information messages
- Alarm trigger labels
- Embedded time, date, and numeric variables

Undefined strings are exported as undefined strings, regardless of whether you select the option in the **Language Configuration** dialog box to show undefined strings using the default language. That option is used only for showing strings during application development and at run time. It does not substitute the default language's strings for undefined strings in the exported file or spreadsheet.

Export text in Unicode format

When you export text in Unicode format, these text strings are also exported:

- Text descriptions and error messages for the Change Password window. These strings are exported if you use a password button in your application.

You can translate these strings, but you cannot change their language dynamically at run time the way you can for graphic object strings.

For the **Change Password** window, the runtime application will use the strings that are in the application when the runtime application is created. For example, if the current application language is French, and you have imported French text strings for the Change Password window, then the French strings will be compiled in the runtime application. If the operator opens the window, the strings will be shown in French. If the operator changes to another language, the strings will still be shown in French.

Unicode file name format

The format for the exported Unicode text file name is <*ApplicationName*><*HMIServerName*><*RFC1766*>.txt, where:

- <*ApplicationName*> is the name of the application.
- <*HMIServerName*> is the name of the HMI server containing the text strings you exported. This is always the same name as the application name.
- <*RFC1766*> is the RFC1766 name associated with the language selected for the export operation.

For details about the schema of exported Unicode text files, see File schema on page 207.

For a list of Windows languages and the corresponding RFC1766 names, see Mapping languages to RFC1766 names on page 601.

Export text to a Microsoft Excel spreadsheet

FactoryTalk View supports Microsoft Excel versions 2000, 2002, 2003, 2007, 2010, and 2013. The exported file is in Microsoft Excel 5.0/95 Workbook format, with the extension .xls.

The maximum number of characters viewable in an Excel cell depends on the version of Excel and the font size. If the maximum is exceeded, the cell will be blank.

Optimizing duplicate strings

When you export text to an Excel spreadsheet, you have the option of optimizing duplicate strings. FactoryTalk View analyzes the text and indicates repeated instances of the same string using a reference number. This way the translator only needs to translate the text once. When you import the translated strings from the spreadsheet into the application, FactoryTalk View copies the translated string into all the graphic objects that used the string originally.

Excel spreadsheet file name format

The format for the exported spreadsheet file name is <*ApplicationName*>_<*ExportVersion*>.xls, where:

- <*ApplicationName*> is the name of the application.

- <*ExportVersion*> is an incremental number assigned to each successful export operation.

For details about the schema of exported spreadsheet files, see Translate application text in Excel spreadsheet files on page 205.

For a list of Windows languages and the corresponding RFC1766 names, see Mapping languages to RFC1766 names on page 601.

Exported language string file locations

Exported language files are saved at this default location:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\Strings**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\Strings**

You can specify another location if desired.

To export application text

1. From the **Tools** menu, select **Languages**.
2. In the **Language Configuration** dialog box, select the application language for which to export text strings.

   If you are going to export strings for all languages defined for the application, it does not matter which language is selected in the **Language Configuration** dialog box.
3. Click **Export**.
4. Follow the instructions in the String Import Export Wizard.

   For details about options in the String Import Export wizard, click **Help**.

If you export to a Unicode text file multiple times to the same location, previously exported versions are overwritten.

Problems exporting

You do not have to check every text file created during an export to verify that text strings were exported correctly. If errors occur, or if you cancel the

export while it is in progress, a message appears in the **Diagnostics List**, and in the FactoryTalk Diagnostics log file.

In addition, errors are shown when they occur in a log file called ExportErrors.txt, which is saved at this location:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\Strings**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\Strings**

Existing error log files are overwritten for each subsequent export operation that generates errors.

Translate application text in Excel spreadsheet files

This section contains information about the format and schema of the exported Microsoft Excel spreadsheet file.

The spreadsheet contains a header row followed by a row for each text string in the application. There is a column for each language defined in the application. The default language is first, followed by the remaining languages in alphabetical order by RFC1766 name. All cells use the text format.

Do not delete the header row in the spreadsheet. FactoryTalk View requires this information when you import the translated text into your application. Similarly, do not change the cell formats.

If you select the option to optimize duplicate strings, there is a reference column to the left of each language column. Do not change the information in the reference columns.

Translate application text in Unicode files

This section contains information about the format and schema of the exported Unicode text file. It also contains information about using Microsoft Excel or Windows Notepad to edit the file.

Because FactoryTalk View requires that parts of the text file remain the way they were exported, give the information in this section to the translator, to ensure that the file can be imported after it has been modified.

File name and format

You will likely want to rename the file before translating it, to avoid confusing it with the original file. You can use any file name ending with the file extension .txt.

To import text into a FactoryTalk View application, you must save the file as tab-delimited text, in Unicode text format.

Open the text file in Microsoft Excel

When you open the text file in Microsoft Excel, the Text Import Wizard appears.

To specify the file format (Step 1 of the wizard)

1. Click **Delimited**.
2. In the Start import at row box, type or select 1.
3. In the File origin list, click **Windows (ANSI)**.
4. Click **Next**.

To specify the field delimiter (Step 2 of the wizard)

1. Select the **Tab** check box. If any other check boxes are selected, clear them.
2. Make sure the **Treat consecutive delimiters as one** check box is cleared.
3. Click **Next**.

To specify the column data format (Step 3 of the wizard)

1. If it is not selected already, under **Column data format**, click **General**.
2. Click **Finish**.

Save the text file in Microsoft Excel

To save the file

1. From the **File** menu, select **Save**.
2. Excel warns that the file may contain features that are not compatible with Unicode text.
3. When prompted to keep the workbook in Unicode format that leaves out incompatible features, click **Yes**.
4. Close the file.
5. When prompted to save changes, click **Yes**.

6. When prompted again to keep the workbook in Unicode format that leaves out incompatible features, click **Yes**.

Differences in file format for files saved in Excel

If you use Notepad to open a Unicode text file that was saved in Excel, you will notice some differences from a file edited and saved in Notepad.

You do not have to change the format of the file before you import it into FactoryTalk View.

The differences are:

- Double quotes surrounding the string definitions are removed for most strings.
- String definitions containing embedded double quotes or other characters that Excel treats as special characters, such as commas, are enclosed within double quotes.
- Any embedded double quotes are converted to a pair of double quotes.

Save the Unicode text file in Notepad

When saving the file, save it using the Unicode encoding option in the **Save As** dialog box.

File schema

Comments

The text file uses the # symbol as a comment delimiter if it is the first character on a line.

Header

The first seven lines of the text file contain header information that must not be translated or modified.

Body

The body of the text file starts on line eight, and includes the following columns:

Column	Component type	Component name	String reference	"String definition"
Example	Graphic Display	Pump station	1	"Stop motor"

The file is sorted alphabetically by component name, and then numerically by string reference number.

Each string reference number refers to a different object in the component. In the example shown above, string reference 1 might refer to a Momentary push button in the graphic display called Pump station.

The string definition is enclosed in quotes in Notepad, but not in the spreadsheet column in Excel.

In the translated text file, the only text that can be modified is the text inside the quotation marks in the string definition column. For example, translated into German, the file would contain these changes:

Column	Component type	Component name	String reference	"String definition"
Example	Graphic Display	Pump station	1	"Motor abschalten"

Do not change the entries in the component type or component name columns, unless the component was renamed in the application after the text was exported.

Do not modify the string reference number. The string reference number is a unique number that is assigned to an object by FactoryTalk View. Modifying the string reference number prevents FactoryTalk View from identifying the object correctly when you import the text.

Work with pairs of double quotes

If a text string contains double quotes, the whole string definition must also be enclosed in double quotes. For example:

Call "Duty Manager"

must be entered in the string file as:

"Call "Duty Manager""

Import text containing multiple sets of double quotes

If the string definition contains an odd number of double quotes, the number of double quotes is rounded down to an even number, and then each pair is imported as one double quote. For example, the string:

"Call "Duty Manager"

appears in the application as:

Call Duty Manager

Work with backslashes and new line characters

To force text to begin on a new line, precede the text with the characters **\n**. For example:

Motor\nStopped

appears in the application as:

Motor

Stopped

To make the characters \n appear as part of the text, type \\n. To make a backslash appear in the application, type two backslashes (\\).

Import text containing multiple backslashes

If the imported text file contains an odd number of backslashes next to each other, one of the backslashes will be ignored.

For example, the string:

Seven\\\Eight

is imported into the application as:

Seven\Eight

Import text

You can import text strings saved in Unicode text format or in Microsoft Excel spreadsheet format.

If your text strings are in Microsoft Excel spreadsheet format, only text strings that exist in the spreadsheet are imported. This means that existing strings in the application are not deleted during the import if they are not in the spreadsheet.

Back up the text in your application before importing. You can do this by exporting the text.

Save the backup file in a different location than the translated file you are about to import.

To import text into your application from a text file

1. From the **Tools** menu, select **Languages**.
2. In the **Language Configuration** dialog box, select the application language for which to import text strings.

   If you are going to import strings for multiple languages defined in an Excel spreadsheet, it does not matter which language is selected in the **Language Configuration** dialog box.
3. Click **Import**.
4. Follow the instructions in the String Import Export Wizard.

   For details about options in the String Import Export wizard, click **Help**.

If you cancel the import before it is complete, any text strings that were changed are not restored to their original values. To restore the text that was originally in the application, import the text from the backup file you created.

Problems importing

You do not have to check every graphic display in your application to verify that text was imported correctly. If errors occurred while importing text, they are shown automatically from a log file called ImportErrors.txt in the following folder:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\Strings**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\Strings**

Each time errors occur while importing text into an application, the ImportErrors.txt file is overwritten.

If errors occurred while importing text, or if the import was canceled, a message appears in the **Diagnostics List**, and in the FactoryTalk Diagnostics log file.

Cancel importing

If some, but not all, of the text in an application seems to have been modified, the import might have been canceled. If you cancel the import before it is complete, any text strings that were changed are not restored to their original values. To restore the text originally in the application, import the text from the backup text file you created before importing.

Set up multiple language support for graphic libraries

When you create an application, the graphic libraries installed with FactoryTalk View are "language neutral" by default.

This means that graphic objects in the libraries always show their text strings as shipped, regardless of the current application language. Since the current application language is ignored, text strings never appear as undefined.

You can change the default for any graphic library, so that it supports multiple languages instead of a single language. When you do this, when you open the library you can view the text strings that are defined for the current application language. If the library's text strings have not been defined for the current language, the undefined strings appear as single question marks.

If you turn off a graphic library's multiple language support, and then save the library, only strings for the current application language are saved. The current application language therefore becomes the "language neutral" language. Any strings for other languages are deleted.

To turn on support for multiple languages in a graphic library

1. Right-click an empty area in the graphic library display, and then select **Display Settings.**
2. In the **General** tab, select **Support Multiple Languages**.

After you turn on support for multiple languages, when you save the graphic library, all strings that support language switching are saved in the current application language. For information about saving libraries in multiple languages, see Use libraries to store displays with multiple languages on page 316.

Use graphic libraries that support multiple languages

To use the graphics libraries in an application, you can add a graphic library into the Displays folder or copy objects from a graphic library into a graphic display. If the graphic library supports multiple languages:

- When you add the graphic library into the Displays folder, all strings, including strings for languages that are not supported by the application, are included with the display.
- If you copy an object from the graphic library into a graphic display, only strings for languages supported by the application are copied.

For more information about using graphic libraries, see Use graphic displays on page 299.

Set up display navigation

This chapter describes:

- What display navigation is
- Develop a hierarchy of displays
- Test display navigation
- Use graphic objects to navigate
- Control display changes remotely

This chapter describes methods for navigating between graphic displays. For information about navigating between objects in a graphic display, see Use the keyboard to navigate to and select objects on page 395.

About display navigation

The term display navigation refers to the way the operator moves between the graphic displays that make up an application.

Use these methods to set up display navigation for your application:

- Develop a hierarchy of graphic displays, to chart how users will navigate the application.
- Determine which users will have access to which parts of the application.
- Create graphic objects that the operator can use to navigate the application.
- Use the **Remote Display Number** connection to automatically control display changes. The use of this connection is optional. Assign it in the **Global Connections** editor.
- In the Startup editor, specify the graphic display to open when the application starts.
- Set up security so that only authorized users have access to the application or parts of the application.

For information about setting up security, see Set up security on page 175.

Develop a hierarchy of displays

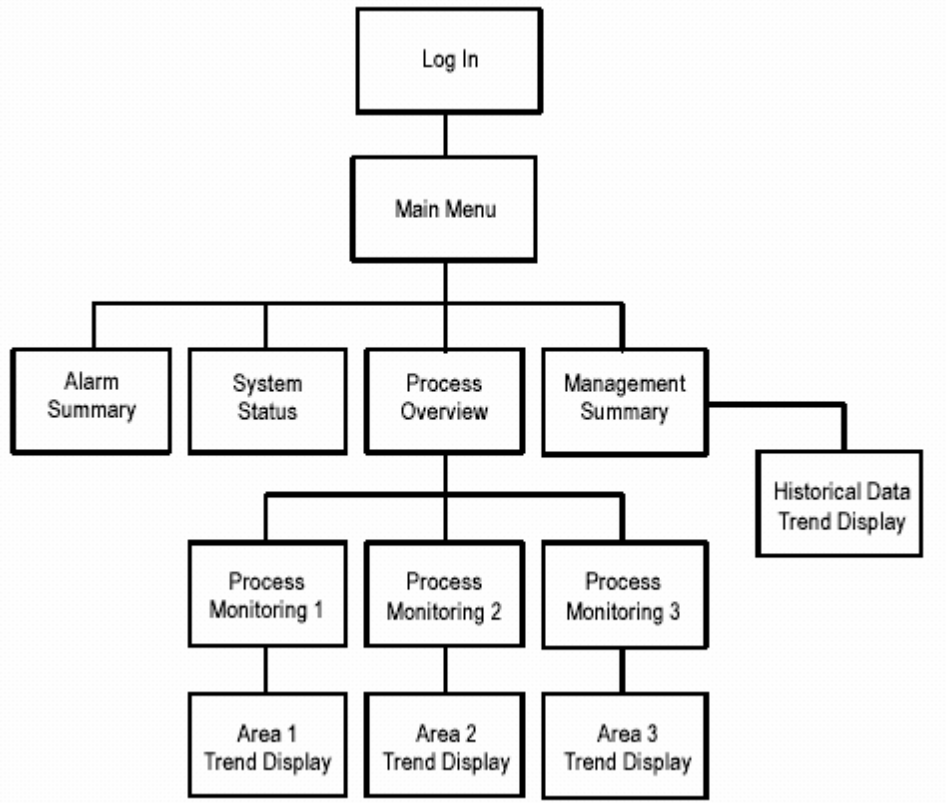
A hierarchy of displays is a series of graphic displays that provide progressively more detail as users move through them. Design your display hierarchy to meet the needs of the various users, including managers, supervisors, and operators.

If you plan to use security, determine which groups of users need access to which displays, and decide where in the hierarchy to locate login, logout, password, and shutdown buttons. For information about setting up security, see Set up security on page 175.

A display hierarchy could include:

- An initial graphic display for logging in
- A graphic display that serves as a menu
- An overview of the plant
- A comprehensive display of each process being monitored
- Process-specific displays that provide more detail
- Management summary displays
- Trend displays of historical and current data

The following illustration shows a sample display hierarchy.



Test display navigation

Once you set up display navigation for your application, test the application to make sure that navigation flows smoothly and that you have avoided problems like these:

- A graphic display contains no buttons for moving forward or back.
- When a graphic display closes, no other display is open and there is no way to continue using the application.

For information about testing your application, see Test your application on page 221.

Use graphic objects to navigate

Use these graphic objects to navigate through the displays in the application:

Use this object	To do this
Goto display button	Open the specified graphic display.
Goto configure mode button	Stop the application and open the FactoryTalk® View ME Station dialog box.
Return to display button	Close the current display and open the previous display.
Close display button	Close the current display. Can send a value to a tag when the display closes.
Display list selector	Provide a list of graphic displays so the operator can select which display to open.
Shutdown button	Stop the application and exit FactoryTalk® View ME Station.

The behavior of these graphic objects depends on which types of graphic displays are used. See the following sections for details.

For detailed information about setting up graphic objects, see Help.

Switch languages

If the application uses multiple languages and operators will be switching languages at run time, place **Language Switch** buttons in a display that the operators have access to. For example, put the buttons in the display that opens when the operators log in. Create a **Language Switch** button for each language that the operators will be using.

For more information about setting up multiple languages, see Set up language switching on page 197.

Display type

The display type you use gives you additional control over how the operator navigates between displays. For example, use the On Top type to keep a graphic display on top at all times, even when another display has focus. Or use the Replace type if you want a display to replace all other open displays when it opens.

For more information about display types, see About display types on page 310.

Goto display buttons

When you set up a Goto display button, specify the graphic display to open when the operator presses the button at run time.

The specified display does not open if the operator does not have security access for the display.

You can also assign a parameter file or parameter list that assigns tags to tag placeholders in the display when the display opens. For more information about parameter files and lists, see Use parameters and global objects on page 501.

For information about setting up **Goto display** buttons, see Help.

How display types affect the button's behavior

The Goto display button's behavior at run time also depends on which types of graphic displays are already open and which type of display it is opening:

- If the graphic display assigned to the button is a Replace display, it closes any open On Top or Replace displays. It does not close any On Top displays that use the **Cannot Be Replaced** option.
- If the display assigned to the button is already open, but does not have focus, pressing the button gives the display focus.

The operator cannot use the Goto display button to open Replace displays if display change is currently controlled remotely (using global connections). But the operator can still open On Top displays.

Goto configure mode buttons

When the operator presses a goto configure mode button at run time, the current application stops running and the **FactoryTalk View ME Station** dialog box opens.

While in configure mode, the operator can use FactoryTalk View ME Station to change applications, application settings, and terminal settings. The operator can also delete log files. For more information about the **FactoryTalk View ME Station** dialog box, see Run applications on a personal computer on page 229.

Return to display buttons

When the operator presses a return to display button at run time, the graphic display that the button is on closes and the display that was previously open reopens.

The current display does not close if:

- The display change is currently controlled remotely (using global connections).
- There were no previously opened Replace displays.
- The operator does not have security access for the previous display. This can only occur if a new user logs in using a login button in the current display.

The return to display button only goes back to the most recent display. It does not go back through a series of displays.

For information about setting up return to display buttons, see Help.

How display types affect the button's behavior

Both the current display and the previous display must be Replace displays. When the operator presses the return to display button:

- If the graphic display that is closing is a Replace display, the display closes and the previously opened Replace display opens. Any On Top displays that were previously open with the Replace display are not reopened.
- If the graphic display that is closing is an On Top display, the display closes but no display is reopened.

We therefore recommend that you use return to display buttons in Replace displays only.

Example: Navigating through displays

This example uses the display hierarchy illustrated in Develop a hierarchy of displays on page 214, and shows what happens as the operator navigates through the hierarchy. The graphic displays are all Replace displays.

1. In the Main Menu display, the operator uses a display list selector to open the Process Overview display.

2. In the Process Overview display, the operator presses a Goto display button to open the Process Monitoring 1 display.

3. After viewing the state of the process, the operator presses a return to display button to close the current display and reopen the Process Overview display.

4. In the Process Overview display, the operator presses a return to display button. Which display opens? The Process Monitoring 1 display (because this was the previously opened display).

   To return to the Main Menu display from the Process Overview display, the operator would have to press a Goto display button that is set up to open the Main Menu display.

Close display buttons

When the operator presses a close display button at run time, the graphic display that the button is on closes. You can set up the button to write out a value when the display closes.

If the graphic display that is closing is a Replace display, and the display change is controlled remotely, the display does not close. If the display does not close, the close value, if any, is not written out.

If the display change is controlled by the operator and the graphic display that is closing is a Replace display, if there are no On Top displays open, an empty window is shown. The operator will not be able to use the application again (unless a remote display change occurs or an alarm, activity, or information message display opens).

We therefore recommend that you use close display buttons in On Top displays only.

For information about setting up close display buttons, see Help.

Display list selectors

Use the display list selector to show a list of graphic displays that the operator can choose from. The operator can scroll through the list and select the graphic display to open.

The specified display does not open if the operator does not have security access for the display.

You can also assign a parameter file or parameter list that assigns tags to tag placeholders in the display when the display opens. For more information about parameter files and lists, see Use parameters and global objects on page 501.

For information about setting up display list selectors, see Help.

How display types affect the selector's behavior

The display list selector's behavior at run time also depends on which types of graphic displays are already open and which type of display it is opening:

- If the selected graphic display is a Replace display, it closes any open On Top and Replace displays. It does not close On Top displays that use the Cannot Be Replaced option.
- If the selected display is an On Top display, it opens on top of the current display. The current display does not close.

The operator cannot use the display list selector to open Replace displays if display change is currently controlled remotely. But the operator can still open On Top displays (with or without the Cannot Be Replaced option).

Select the display to open

The operator can scroll through the list and select displays using the key button graphic objects, or, if the list has the input focus, by using the arrow keys and Enter key on a keypad or external keyboard.

You can link key buttons to a specific display list selector, or set up the buttons to work with whichever object is selected in the graphic display.

For information about input focus, see What input focus looks like on page 395. For information about linking buttons to the display list selector, see Link buttons to objects on page 397.

Shutdown buttons

When the operator presses the shutdown button at run time, the application stops and FactoryTalk View ME Station closes.

To prevent an unauthorized user from stopping the application, assign visibility animation to the shutdown button. For details, see Application examples on page 187. Or, place the button in a display that only authorized users have access to.

For information about setting up shutdown buttons, see Help.

Control display changes remotely

To control display changes remotely, you can set up the data source to open graphic displays using global connections.

Global connections are connections that apply to your entire runtime application. Global connections allow the data source to control or interact with your application at run time.

For example, the **Remote Display Number** connection is a global connection that you can use to control display changes from the data source. You can also use global connections to apply parameters to the displays that are opened from the data source, to close one or more On Top displays from the data source, to print graphic displays from the data source, to run macros from the data source, to control the date and time displayed on the runtime terminal, to set the intensity of PanelView backlights, and to monitor runtime RAM usage. For more information about global connections, see Set up global connections on page 111.

Create runtime applications

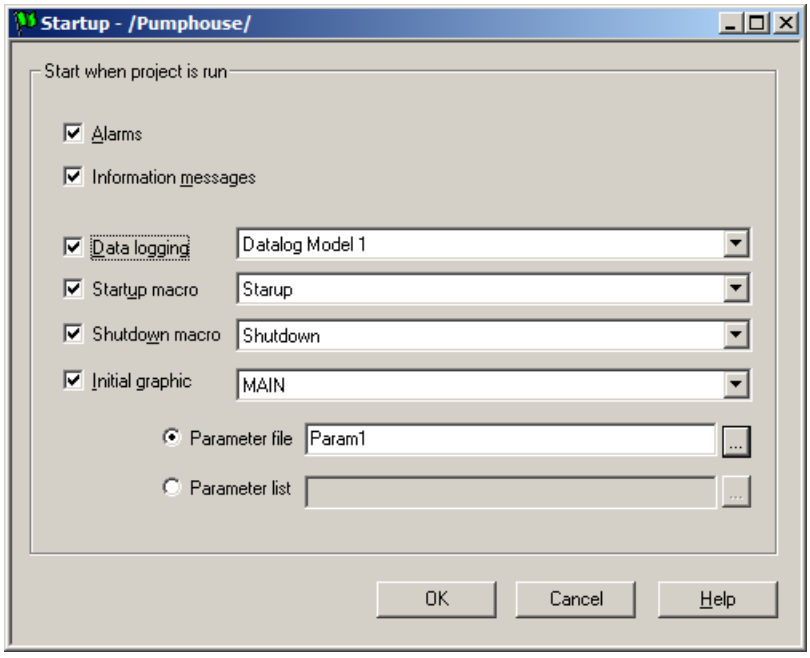
This chapter describes:

- Specify startup settings
- Test your application
- Create runtime application files
- Convert runtime application files to development applications

Specify startup settings

Use the Startup editor to specify which application processes and components to start when the application starts at run time.

You can specify startup settings once you have set up all the parts of the application, or you can specify processes and select components in the Startup editor as you create them.



For detailed information about the options in the Startup editor, see Help.

Test your application

You can test your application in FactoryTalk View Studio at any time during the development process, to make sure that everything works the way you intend.

If the development computer is connected to the data source, you can test all functions of the application, including security settings, language switching, communications, and alarm monitoring.

A FactoryTalk View ME Station emulator opens on the development computer and runs the application. This runtime version of the application is a temporary version for testing use only. You cannot run it on another computer.

There is a two-hour time limit for test running the application in FactoryTalk View Studio.

The procedure in this section shows you how to test your entire application. For information about testing a single graphic display, see Test your displays as you work on page 308.

To test your application in FactoryTalk View Studio

1. On the **Application** menu, click T**est Application**, or click the Test Application tool .
2. If your application uses multiple languages, specify the languages to include and the initial runtime language, and then press Finish. For details, see Help.
3. Test your application.
4. To stop your application, press a shutdown button, or type the character ‘x.’

   Make sure you provide the operator with a method for shutting down the application at run time. For more information about methods for shutting down applications, see Shut down applications on page 234.

Once you have tested your application to make sure everything works the way you intend, create the runtime application file and transfer the file to the runtime computer.

Create runtime application files

Before you can run your application, you must create a runtime version. When you create the runtime version, FactoryTalk View Studio compiles all of the necessary application information into a single file with the extension .mer.

Create .mer files for previous versions

You can specify the version of FactoryTalk View ME Station for which to create the .mer file. For example, if the application will run on a terminal that

uses FactoryTalk View ME Station version 3.20, you can specify that version for the .mer file.

Note: Version 6.0 or earlier .mer files created on a 64-bit operating system cannot be converted to design-time projects (MED files).

If the application contains features that are not supported by the version you select, FactoryTalk View shows a validation report that lists the unsupported features. The runtime application file is not created. You must remove or turn off the unsupported features before you can create the runtime application file.

For information about the features supported in different versions of FactoryTalk View, and how to remove or replace them, see Features supported in different versions of FactoryTalk View on page 605.

Note: PanelView Plus 7 or PanelView Plus 6 terminals cannot process a Gradient Fill that uses a Diagonal Up or Diagonal Down direction, nor can the PanelView Plus 7 or PanelView Plus 6 terminal apply a Gradient Fill to a rotated object. While running an MER on a PanelView Plus 7 or PanelView Plus 6 terminal, the gradient attributes will be animated using the gradient fill starting color as the object's solid color background.

When running the MER on a computer, the system can process all gradient fills and this warning does not apply.

Convert .mer files to development applications

For FactoryTalk View version 5.00 and later .mer files, you can convert the runtime .mer file back to a development application (.med file). This option is useful if:

- You lose or don't have access to the original .med file and you need to make a change to the application.
- You make changes to the .mer file at run time, such as adding passwords, updating RSLinx Enterprise device shortcuts, or saving recipes, and you need to make a change to the application but don't want to lose this runtime information.

  Starting with FactoryTalk View 8.0, all security information modified at runtime is saved in the .mer files. These changes will be restored after converting FactoryTalk View 8.0 .mer files to .med files.
- You need to extract information that was generated at run time, such as updated RecipePlus files.

Version 6.0 or earlier .mer files created on a 64-bit operating system cannot be converted to design-time projects (MED files). This is due to an

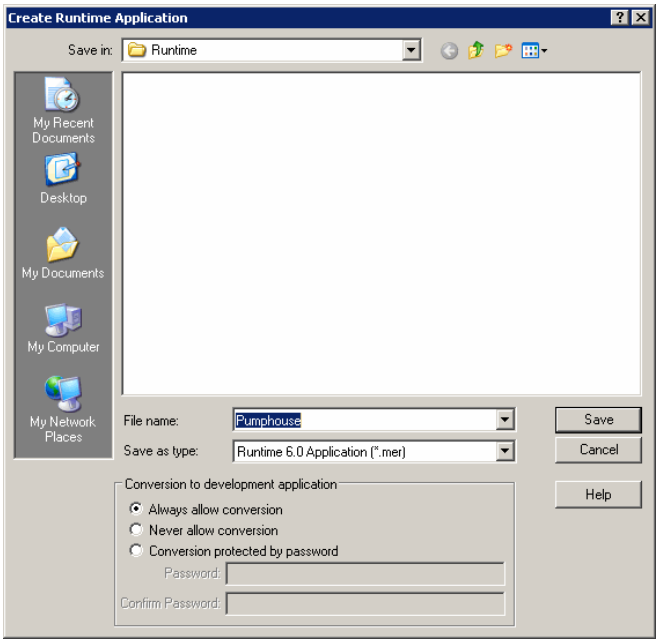
incompatibility of the previous FactoryTalk View database engine with 64-bit operating systems. Thus, when you create a version 6.0 or earlier .MER file on a workstation running 64-bit operating system, the only option available in FactoryTalk View Studio is **Never allow conversion**. When creating a version 6.0 or earlier .MER on a workstation running a 64-bit operating system, this is the default option (and only choice) for the **Conversion to development application setting**.

When you create the .mer file, you can specify whether or not to allow conversion of the runtime .mer file, and whether to require a password to convert the runtime application.

For more information about converting .mer files to development applications, see Convert runtime application files to development applications on page 226.

To create a runtime application

1. In FactoryTalk View Studio, with the application open, on the Application menu, click **Create Runtime Application**.



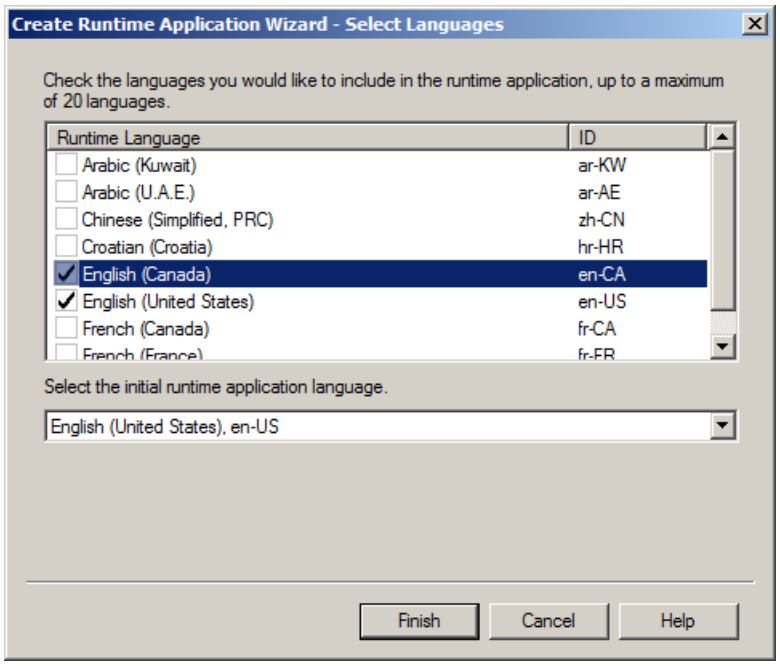
2. Specify the folder and file name for the runtime application.

3. In the Save as type box, specify the version of FactoryTalk View ME Station for which to create the .mer file.

4. For version 5.00 and later .mer files, if you don't want to allow the runtime application to be converted to a development application, click **Never allow conversion.**

5. For version 5.00 and later .mer files, if you require that the user enter a password to convert the application, click **Conversion protected by password**. Type the password in the two boxes.

   The password can be up to 100 characters long. The password is case sensitive. Click **Save**.



6. If your application uses multiple languages, specify up to 20 languages to include in the runtime application, and specify the initial runtime language. For details, see Help.

   This wizard is not shown if your application uses only one language.

   To show undefined strings in the default language at run time, include this language in your selection. The default language is also required for filtering alarms. For more information about the default language, see The default language on page 198.

7. Click **Finish**.

For information about transferring the runtime application:

- To a personal computer, see Run applications on a personal computer on page 229.
- To a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, see Transfer applications to a PanelView Plus terminal on page 247.

Convert runtime application files to development applications

For FactoryTalk View version 5.00 and later .mer files, you can convert the runtime application file back to a development application. This allows you to make changes to the application without losing runtime information such as passwords and RecipePlus data.

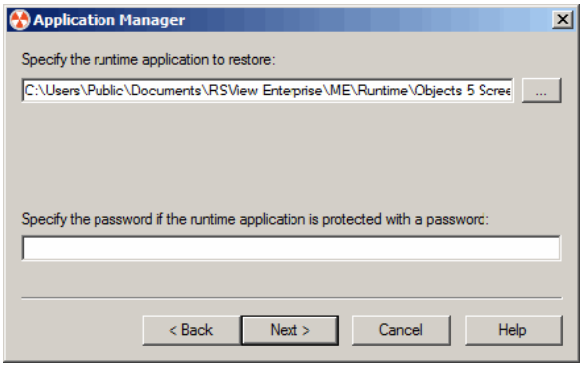
To convert the runtime application file, use the Restore runtime application operation in the Application Manager. Data logging and alarm data that occurred at run time are not restored to the development application.

RSLinx Enterprise device shortcuts that were edited at run time are restored when you convert the runtime application to a development application. However, the **Runtime** tab in the **RSLinx Enterprise Communication Setup** editor might not show the device configuration for the runtime application. Make sure the **Runtime** tab shows the correct device configuration before making any changes to the shortcuts.

Note: RSLinx Enterprise device shortcuts that were valid on the runtime terminal might not exist or might be invalid on the development computer. Review all device and tag file shortcut assignments in the RSLinx Enterprise Communication Setup editor before you edit, test, or transfer the application.

To convert a runtime application to a development application

1. In FactoryTalk View Studio, from the **Tools** menu, select **Application Manager.**
2. When prompted to select the application type, select **Machine Edition**, and then click **Next**.
3. Click **Restore runtime application**, and then click **Next**.



4. Specify the folder and file name of the runtime application to convert.

5. If you created a password for the file when you created the runtime application, type the password.
6. Click **Next**.
7. Type a name for the converted application, and then click **Finish**.

Run applications on a personal computer

This chapter describes:

- Move applications to the runtime computer
- Start FactoryTalk View ME Station
- Load and run applications
- Shut down applications
- Edit device short cuts
- Look up contact information for technical support
- Set up FactoryTalk Diagnostics at run time
- Set up serial ports for KEPServer Enterprise
- Set up RSLinx Enterprise communication drivers
- Specify the printers to use at run time
- Specify startup options for FactoryTalk View ME Station
- Delete log files on the runtime computer
- Specify the time, date, and number formats to use at run time
- Use the DeskLock tool

Steps for transferring applications to a PanelView Plus terminal

Follow these steps to:

- Install hardware and software on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal.
- Transfer your application to the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal.

For information about installing FactoryTalk View ME Station, see the *FactoryTalk View Machine Edition Installation Guide*.

Install hardware and software on the runtime computer

1. If you will be printing displays, alarms, or diagnostics messages, set up printer connections on the runtime computer.

   For more information, see Specify the printers to use at run time on page 238.

2. If you are using RSLinx Enterprise, set up communications as described in Set up communications on page 79.

3. If you are using RSLinx Classic as the OPC server on the runtime computer, install RSLinx Classic on the runtime computer.

4. If you are using RSLinx Classic on a remote computer, install RSLinx Classic on the remote computer.

5. If you are using an OPC server other than RSLinx Enterprise or RSLinx Classic, install the OPC server software on the runtime computer or on another computer on the network.

   For installation information, see the documentation supplied by your OPC server vendor. For information about OPC, see Set up communications on page 79.

6. If your application uses third-party ActiveX objects, install and register the Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008 version of the objects on the runtime computer.

   For information about ActiveX objects, see Use ActiveX objects on page 353.

7. Install on the runtime computer all languages used by the runtime application.

8. If the runtime computer uses different time, date, or number formats than the development computer, specify the time, date, and number formats to use at run time.

   For more information, see Specify time, date, and number formats on page 244.

9. If desired, use the DeskLock tool to prevent users from switching to another software application or using the Windows desktop at run time.

   For more information, see Use the DeskLock tool on page 245.

Transfer the application

Move the application to the runtime personal computer.

For more information, see Move applications to the runtime computer on page 232.

Set up options in FactoryTalk View ME Station

1. On the runtime computer, start FactoryTalk View ME Station.

   For more information, see Start FactoryTalk View ME Station on page 250.

2. Load the application.

   For more information, see Load and run applications on page 233.

3. Edit device shortcuts, if necessary.

   For more information, see Edit device shortcuts on page 235.

4. Set up FactoryTalk Diagnostics on the runtime computer (if you have not already done so).

   For more information, see Use the Diagnostics Setup tool on page 166.

5. If you will be using KEPServer Enterprise, specify serial port IDs.

   For more information, see Set up serial ports for use with KEPServer Enterprise on page 237.

6. If you will be using RSLinx Enterprise, set up communication drivers (if you have not already done so).

   For more information, see Set up RSLinx Enterprise communication drivers on page 237.

7. Specify the printers to use.

   For more information, see Specify the printers to use at run time on page 238.

8. Specify startup options for FactoryTalk View ME Station.

   For more information, see Specify startup options for FactoryTalk View ME Station on page 239.

Once you have completed these steps, you're ready to run the application. For information about running your application, see Use your application on page 257.

Move applications to the runtime computer

The runtime application file has the extension .mer. You can use any standard file transfer method to copy your runtime application from the development computer to the runtime computer.

You can:

- Copy the application file from the development computer to removable media such as USB thumb drive or USB hard drive, and then from the removable media to the runtime computer.
- If the development and runtime computers are on the same network, use Windows Explorer or My Computer to move the file.

For information about creating the runtime application file, see Create runtime applications on page 221.

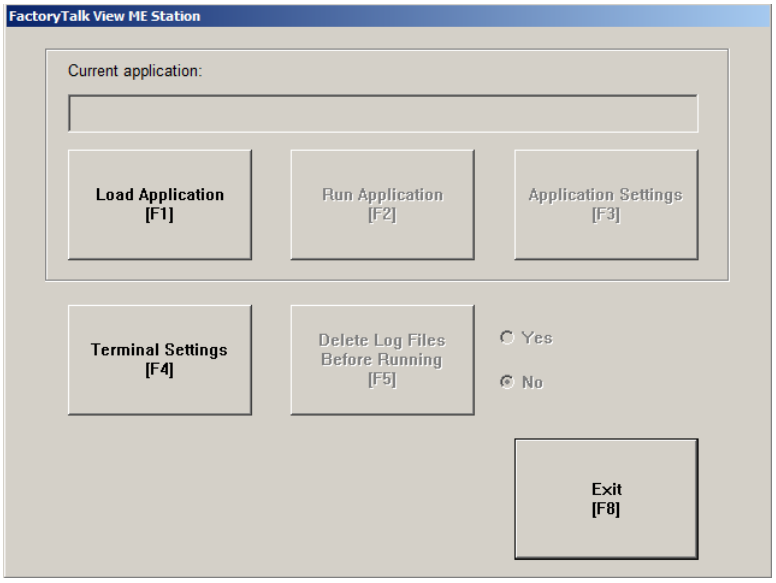
Start FactoryTalk View ME Station

If you are running an application on the development computer, we recommend that you exit FactoryTalk View Studio before starting FactoryTalk View ME Station.

To start FactoryTalk View ME Station

- From the **Windows Start** menu, select **Programs > Rockwell Software > FactoryTalk View**, and then click **FactoryTalk View ME Station**.

  The **FactoryTalk View ME Station** dialog box opens.



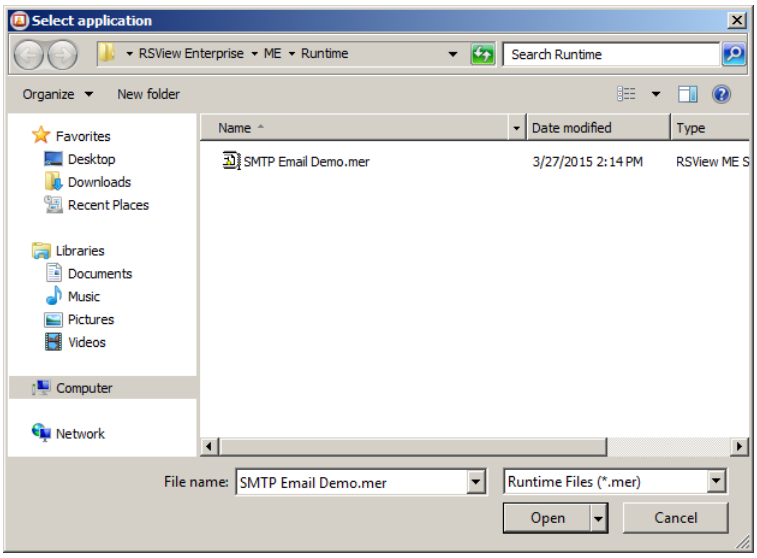
For information about specifying startup options for when FactoryTalk View ME Station starts, see Specify startup options for FactoryTalk View ME Station on page 239.

Load and run applications

You can run any runtime application that is on the runtime computer. Runtime applications have the extension .mer.

To load and run the application

1. In the **FactoryTalk View ME Station** dialog box, click **Load Application**, or press **F1**.



2. Navigate to the folder containing the application's .mer file, and then click the file name.

3. Click **Open**.

4. To replace the runtime computer's communication settings with the application's communication settings, click **Yes**. To keep the runtime computer's communication settings, click **No**.

   You are notified that the application's FactoryTalk System Directory of users and security policies will be loaded on this computer. This is the set of users and policies that have been set up for the application and are contained in the .mer file.

   The computer's existing FactoryTalk System Directory will be archived, and will be restored when you stop the application. To turn off this warning, see Turn off the FactoryTalk Directory Server warning on page 244.

5. To continue, click **Yes**. To stop loading the application, click **No**.

   If you continue, the application name is shown in the Current application box in the **FactoryTalk View ME Station** dialog box.

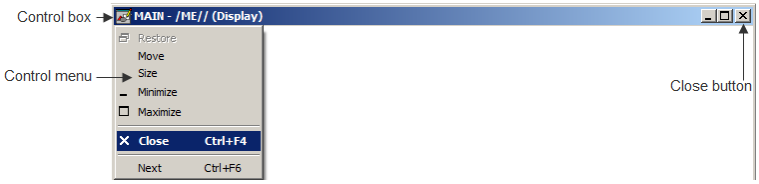
6. To run the application, click **Run Application**.

   The DEFAULT user is logged in. If a macro is assigned to the DEFAULT user, the macro runs.

Shut down applications

To shut down an application, use one of these methods

- Press a shutdown button in a graphic display.
- If the application is set up to use a title bar with a Control box, click the **Close** button at the right end of the title bar.
- If the application is set up to use a title bar with a **Control** box, on the **Control** menu at the left end of the title bar, click **Close**.



For information about using a title bar in graphic displays, see Title bar on page 75.

For information about preventing unauthorized users from shutting down applications, see Application examples on page 187.

What happens when the application shuts down

When the application shuts down:

- If you assigned a shutdown macro (in the Startup editor), the macro runs, assigning values to tags, and then the application stops.

  For information about the Startup editor, see Create runtime applications on page 221.

- FactoryTalk View ME Station closes.
- The computer's FactoryTalk System Directory is restored.

Change application settings

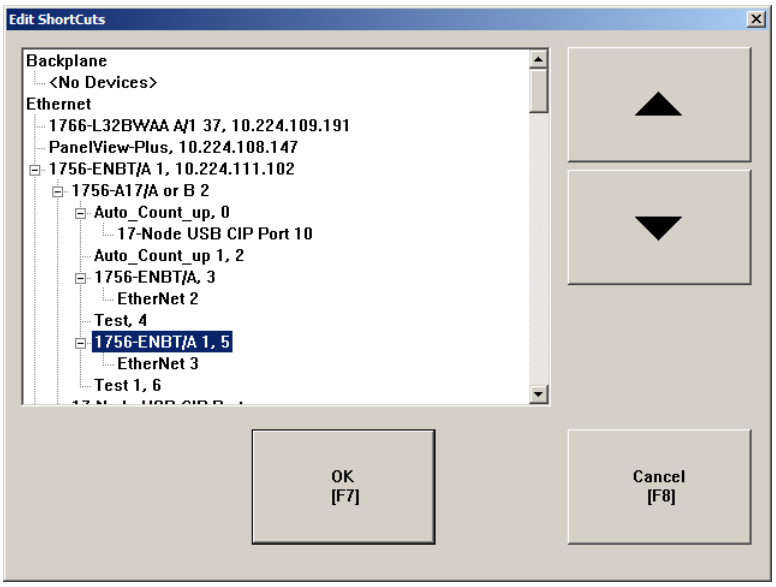
Edit device shortcuts

You can use FactoryTalk View ME Station to edit device shortcuts that have been set up in the application.

Before editing device shortcuts, load the application containing the device shortcut, as described on Load and run applications on page 233.

To edit device shortcuts

1. In the **FactoryTalk View ME Station** dialog box, click **Application Settings**.
2. Double-click **Device Shortcuts**.
3. Double-click the name of the shortcut to edit.

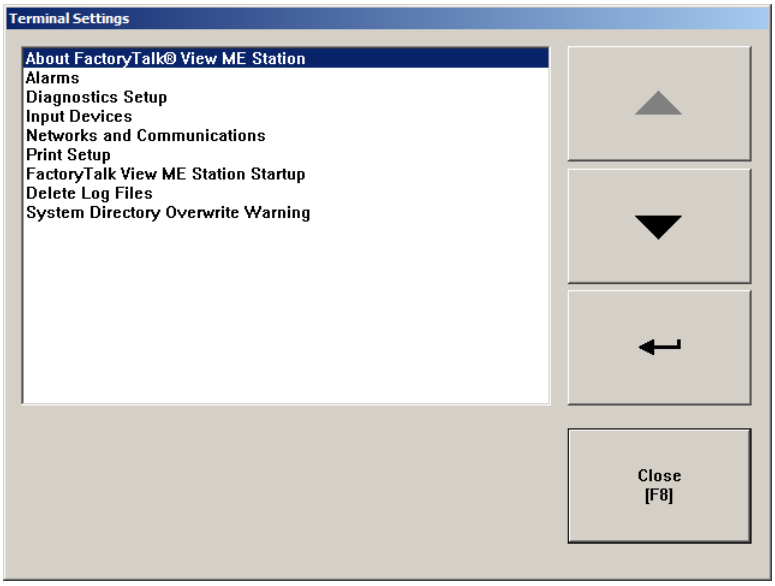


4. In the **Edit ShortCuts** dialog box, click the device you want the shortcut to point to, and then click **OK**.

Look up contact information for technical support

To look up technical support contact information

1. In FactoryTalk View ME Station, click **Terminal Settings**.



2. Double-click **About FactoryTalk View ME Station**.
3. Click **Technical Support**.

   The telephone number and URL for technical support are shown.

Set up FactoryTalk Diagnostics on the runtime computer

You can set up FactoryTalk Diagnostics on the runtime computer using the **FactoryTalk View ME Station** dialog box.

To set up FactoryTalk Diagnostics on the runtime computer

1. In FactoryTalk View ME Station, click **Terminal Settings**.
2. Double-click **Diagnostics Setup**.

   The **FactoryTalk Diagnostics Setup** dialog box opens.
3. Set up FactoryTalk Diagnostics, as described in Use the Diagnostics Setup tool on page 166.

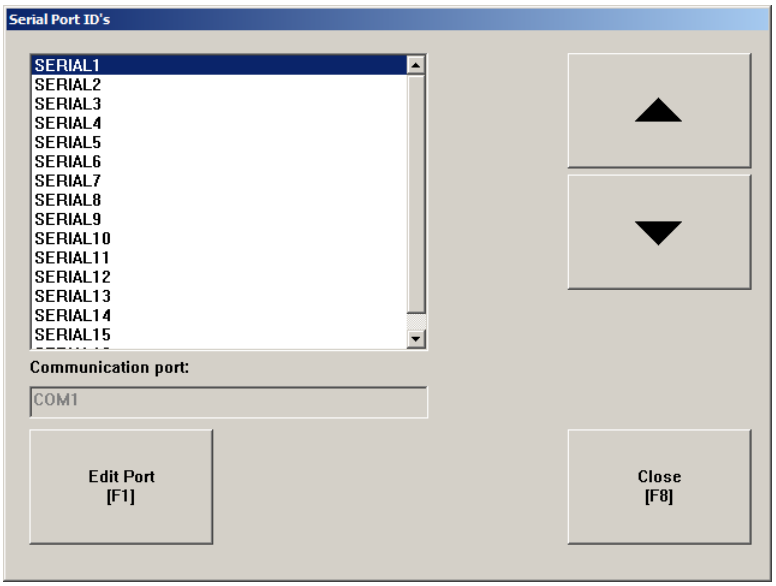
Set up serial ports for use with KEPServer Enterprise

If you plan to use KEPServer Enterprise and serial communications, you must specify which COM port to use.

For information about setting up communications in KEPServer Enterprise, see KEPServer Enterprise Help.

To specify the COM port to use for serial communications

1. In the **FactoryTalk View ME Station** dialog box, click **Terminal Settings**.
2. Double-click **Networks and Communications**.
3. Double-click **KEPServer Serial Port ID's**.



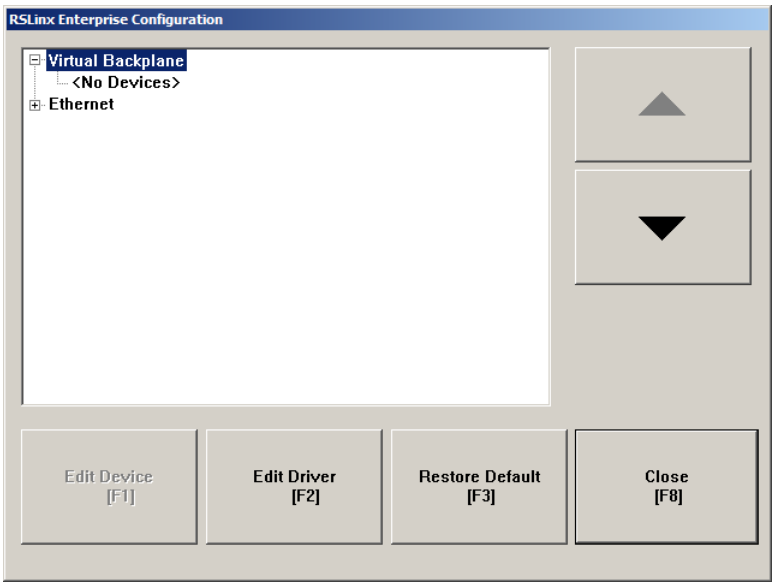
4. In the **KEPWare Serial Port ID's** dialog box, select the serial port ID you specified when you set up the KEPServer Enterprise channel.
5. Click **Edit Port.**
6. In the **Communication Ports** dialog box, select the COM port to use for KEPServer Enterprise communications.

Set up RSLinx Enterprise communication drivers

Use RSLinx Enterprise to set up communication drivers for your runtime application. You can set up the drivers directly in RSLinx Enterprise, or open RSLinx Enterprise by using the **FactoryTalk View ME Station** dialog box.

To set up the RSLinx Enterprise communication driver to use at run time

1. In the **FactoryTalk View ME Station** dialog box, click **Terminal Settings**.
2. Double-click **Networks and Communications**.
3. Double-click **RSLinx Enterprise Communications**.



4. To edit a driver, select it and then click **Edit Driver**.
5. To edit a device, select it and then click **Edit Device**.

For information about setting up RSLinx Enterprise drivers and devices, see the RSLinx documentation.

Once the driver is set up, FactoryTalk View ME Station automatically starts the driver software when you run the application.

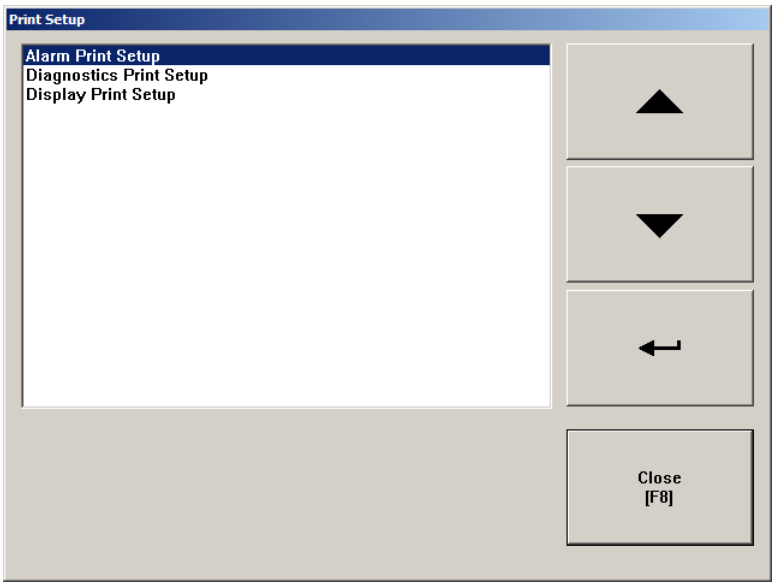
Specify the printers to use at run time

You can use local or network printers to print alarm messages, reports, diagnostics messages, and graphic displays at run time. If desired, you can use a different printer for each type of printing.

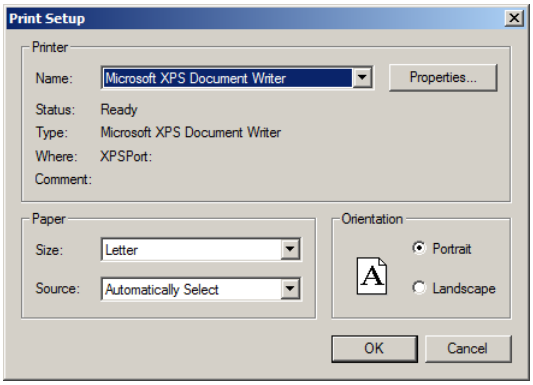
To specify the printers to use at run time

1. In the **FactoryTalk View ME Station** dialog box, click **Terminal Settings**.

2. Double-click **Print Setup**.



3. Double-click the type of printing to set up.



4. Modify the print options as required.

For detailed information about printer options, refer to your Windows documentation.

Specify startup options for FactoryTalk View ME Station

This section describes how to start FactoryTalk View ME Station automatically when Windows starts, and describes startup options for FactoryTalk View ME Station.

When you start FactoryTalk View ME Station, you can:

- Run an application
- Load an application
- Automatically delete an application's log files before running the application

- Replace RSLinx Enterprise communications on the runtime computer with the application's settings

By default, the option to start FactoryTalk View ME Station when Windows starts is turned off. The settings in this section apply only if you want FactoryTalk View ME Station to start automatically when Windows starts.

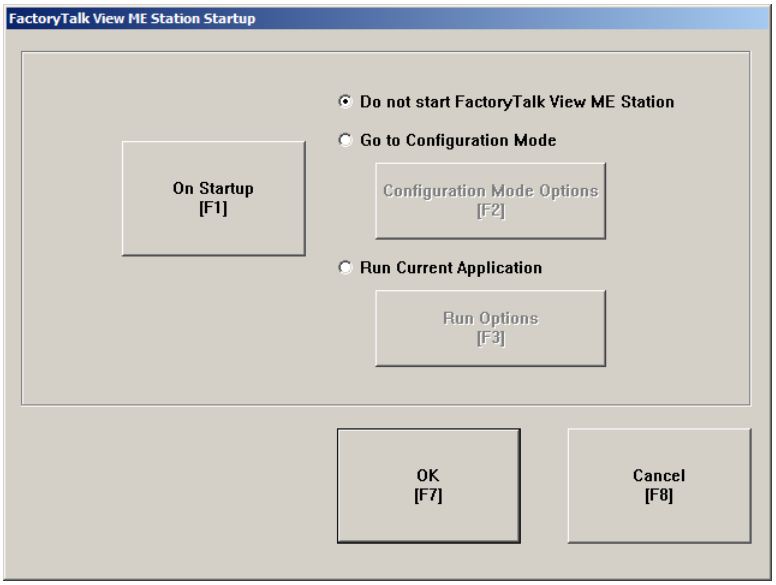
To start FactoryTalk View ME Station and run an application when Windows starts

1. In the **FactoryTalk View ME Station** dialog box, load the application that you want to run.

   For details, see Load and run applications on page 233.

2. Click **Terminal Settings.**

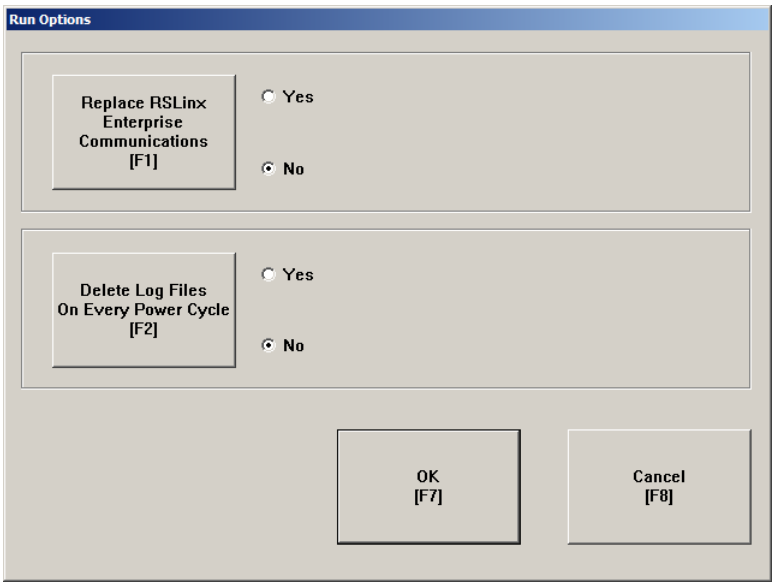
3. Double-click **FactoryTalk View ME Station Startup.**



4. Click **Run Current Application.**

   This option is not available if you have not loaded an application yet.

5. Click **Run Options.**



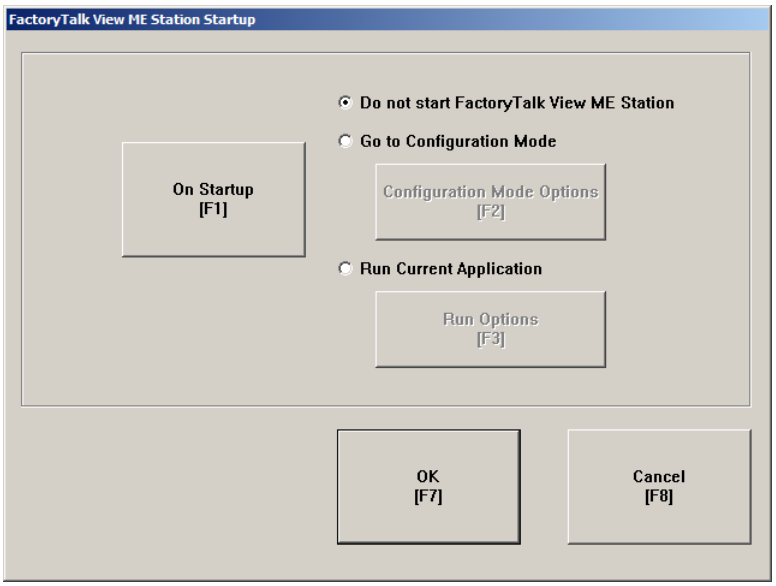
6. Specify whether to replace the RSLinx Enterprise communication settings on the runtime computer with the application's settings when the application starts.

7. Specify whether to delete the application's log files on startup.

To start FactoryTalk View ME Station without running an application when Windows starts

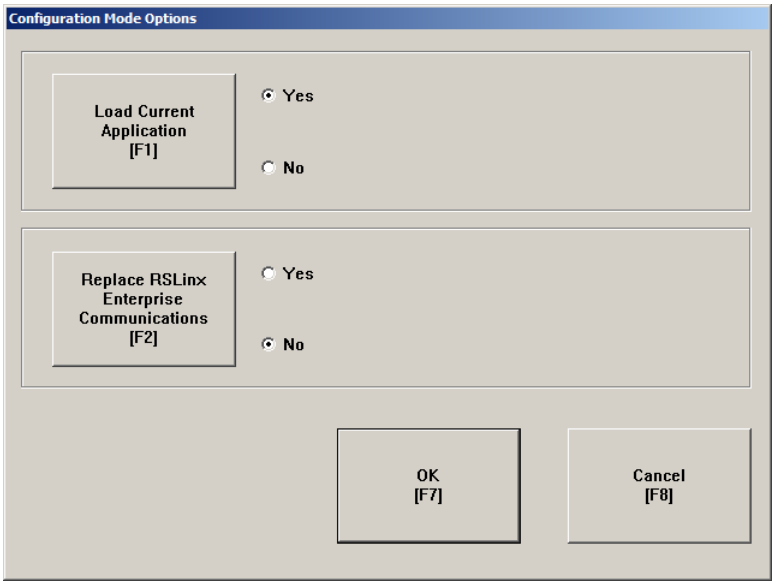
1. In the **FactoryTalk View ME Station** dialog box, click **Terminal Settings**.

2. Double-click **FactoryTalk View ME Station Startup.**



3. Click **Go to Configuration Mode.**

4. Click **Configuration Mode Options.**



5. Specify whether to load the current application when FactoryTalk View ME Station starts.

   This option is not available if you have not loaded an application.

6. Specify whether to replace the RSLinx Enterprise communication settings on the runtime computer with the application's settings when the application starts.

This option is not available if you have not loaded an application.

Use Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008 with ME Station

In order to deploy a HMI system on Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008, one of the following options needs to be selected:

- The operator will need to log into Windows as a member of the Administrators group. The operator can then use ME Station for Windows.
- An administrator can disable the UAC. This allows a Windows user that is a member of the Users group to use ME Station for Windows.
- An operator that is a member of the Users group who knows an Administrators password, and can provide authentication when UAC prompts, can use ME Station.

This allows the operator to load and run an MER as well as configure ME Station for Windows using the Graphical User Interface.

Delete log files on the runtime computer

When you run your application, FactoryTalk View ME Station stores log files for alarms and data logging (if you use these features). When you start FactoryTalk View ME Station, you can delete the alarm and data log files for the loaded application, or for all the applications on the runtime computer.

Run a newer version of the application

If you run a newer version of an application, the alarm log file for the older version is deleted automatically. The data log file for the older version is retained, to allow the display of historical data in trends.

For more information about the alarm log file, see The alarm log file on page 129.

For more information about data log files, see Change the data log model used at run time on page 522.

Delete log files manually

To delete log files for the loaded application

- In the **FactoryTalk View ME Station** dialog box, click **Yes** beside the **Delete Log Files Before Running** button.

  All alarm and data log files for the loaded application are deleted.

To delete log files for all applications on the runtime computer

1. In the **FactoryTalk View ME Station** dialog box, click **Terminal Settings.**
2. Double-click **Delete Log Files.**
3. Click **Yes**.

Log files for data log models that use the default path are deleted. All alarm log files are deleted.

Turn off the FactoryTalk Directory Server warning

When you load an application, you are notified that the application's FactoryTalk System Directory of users and security policies will be loaded on the computer. The computer's existing FactoryTalk System Directory is archived while you run the application. It is restored when you stop the application. **You can turn off this notification warning.**

To turn off the overwrite warning

1. In the **FactoryTalk View ME Station** dialog box, click **Terminal Settings.**
2. Double-click **System Directory Overwrite Warning.**
3. Click **No**.

Specify time, date, and number formats

Time, date, and number formats are used by these graphic objects:

- Numeric display
- Gauge
- Time and date display
- Trend
- Alarm banner
- Alarm list

The time and date formats are also used when printing the alarm history report (using the Print Alarm History button). The numeric and time and date embedded variables also use number, time, and date formats.

All objects use the time, date, and number formats of the current application language. For example, if the application language uses a comma for the decimal symbol, numeric variables use a comma for the decimal symbol.

For information about using multiple languages, see Set up language switching on page 197.

Use the DeskLock tool

Use the DeskLock tool to prevent users from switching to another software application or having access to the desktop at run time.

This tool can have far-reaching effects on your operating system. The DeskLock tool can replace the standard Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008 non-configured desktop with a customized desktop. The customized desktop is intended to prevent operators from having access to other applications and operating system functions such as restarting Windows or shutting down tasks. You can also use the tool to set up an automatic Windows logon and to specify options such as which software applications are allowed or not allowed to run on the computer.

Before using the tool, read the DeskLock Help completely.

To open the DeskLock tool

- From the Windows Start menu, select **Programs > Rockwell Software > FactoryTalk View > Tools**, and then click **DeskLock.**

For details about using the tool, see the tool's Help.

Transfer applications to a PanelView Plus terminal

This chapter describes:

- Start FactoryTalk View ME Station
- Set up communication drivers to transfer applications to a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal
- Transfer applications and TrueType fonts to a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal
- Upload applications from a terminal to the development computer
- Compare applications on the development computer with applications on the terminal

For information about using your application at run time, see Use your application on page 257

For information about using FactoryTalk View ME Station on the terminal, including setting up communications, printers, and input devices, see the *PanelView Plus Terminals User Manual*.

Steps for transferring applications to a PanelView Plus terminal

Follow these steps to:

- Install hardware and software on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal.
- Transfer your application to the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal.

For information about installing FactoryTalk View ME Station, see the *FactoryTalk View Machine Edition Installation Guide*.

Install hardware and software on a PanelView Plus terminal

1. If you will be printing displays, alarms, reports, or diagnostics messages, connect a printer to the USB or Network port.

   PanelView Plus 7 and PanelView Plus 6 terminals support a wide range of printers. For a list of supported printers, see Answer ID 111636 in Rockwell Automation Knowledgebase.

   PanelView Plus terminals support printing using the Microsoft Windows CE PCL3 printer driver, which is already installed on the terminal. Printing is supported for most laser and ink-jet printers. If you have problems printing, check that your printer is compatible with the PCL3 printer driver.

2. If you are using KEPServer Enterprise, enable the driver you need on the terminal. For more information, see KEPServer Enterprise documentation .

   For information about OPC data servers, see Set up communications on page 79.

3. If your application uses third-party ActiveX objects, install and register the Windows CE version of the objects on the terminal.

   For information about ActiveX objects, see Use ActiveX objects on page 353.

Install printers on a PanelView Plus terminal

If you will be printing displays, alarms, reports, or diagnostics messages, connect a printer to the USB or Network port.

PanelView Plus terminals support printing using the Microsoft Windows CE PCL3 printer driver, which is already installed on the terminal. Printing is supported for most laser and ink-jet printers. If you have problems printing, check that your printer is compatible with the PCL3 printer driver.

The PanelView Plus terminal is a *closed box*, which means you must order any software your application will need when you order the system. All software comes pre-installed.

Install hardware and software on a PanelView Plus 7 or PanelView Plus 6 terminal

1. If you will be printing displays, alarms, reports, or diagnostics messages, connect a printer to the USB or Network port.

   PanelView Plus 7 and PanelView Plus 6 terminals incorporate the JETCET PRINT solution for Microsoft Windows CE devices, supporting select Canon, Epson, Hewlett-Packard, and Brother printers. Plug-and-play installation is supported for these printers as well as manual installation if a suitable JETCET print driver is available.

2. If you are using KEPServer Enterprise, enable the driver you need on the terminal. For more information, see KEPServer Enterprise documentation.

   For information about OPC data servers, see Set up communications on page 79.

3. If your application uses third-party ActiveX objects, install and register the Windows CE version of the objects on the terminal.

   For information about ActiveX objects, see Use ActiveX objects on page 353.

Install printers on a PanelView Plus 7 or PanelView Plus 6 terminal

If you will be printing displays, alarms, reports, or diagnostics messages, connect a printer to the USB or Network port.

PanelView Plus 7 and PanelView Plus 6 terminals incorporates the JETCET PRINT solution for Microsoft Windows CE devices, supporting select Canon, Epson, Hewlett-Packard, and Brother printers. Plug-and-play installation is supported for these printers as well as manual installation if a suitable JETCET print driver is available.

Print support is centrally managed and independent of the application. You can add and configure a new printer from the desktop control panel. Printer configurations include the printer name, printer driver, port, and port-specific parameters. New configurations are retained through a power cycle.

Transfer applications

1. On the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, start FactoryTalk View ME Station.

   For more information, see Start FactoryTalk View ME Station on page 250.

2. In FactoryTalk View ME Station, if you're transferring via a serial connection, specify and set up the serial driver. If you are using Ethernet for the transfer, you can skip this step.

   For more information, see Specify the driver to use for the transfer on page 251.

3. On the development computer, set up the RSLinx Enterprise driver to use for the transfer.

   For more information, see Set up a driver for the transfer on the development computer on page 252.

4. Move the application to the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal using the Transfer Utility tool.

   For more information, see Download applications and Windows TrueType fonts on page 253.

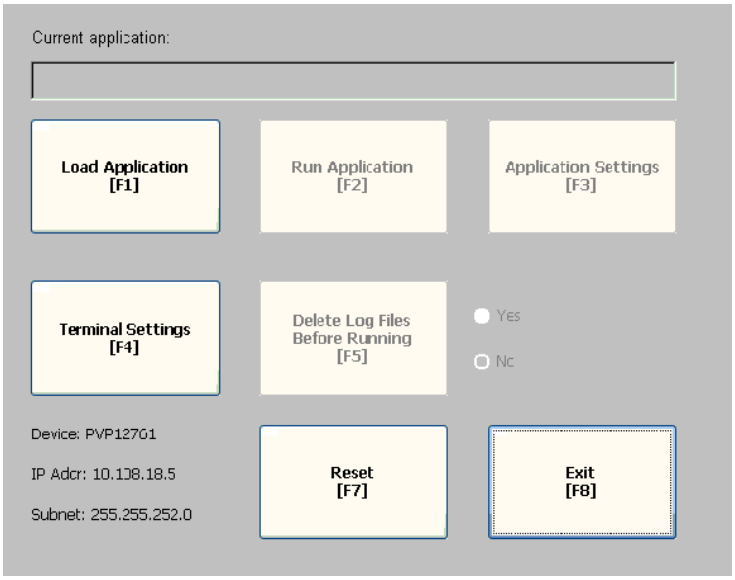
You can also transfer applications to the terminal using a Flash Card. For information about this method, see the *PanelView Plus Terminals User Manual*.

Start FactoryTalk View ME Station

To start FactoryTalk View ME Station on a PanelView Plus 7 or PanelView Plus 6 terminal

- From the Windows Start menu, select **Programs > Rockwell Software**, and then click **FactoryTalk View ME Station**.

The **FactoryTalk View ME Station** dialog box opens.



Start FactoryTalk View ME Station on a PanelView Plus terminal

If you are running a PanelView Plus terminal, the **FactoryTalk View ME Station** dialog box opens automatically when the terminal starts up.

Specify the driver to use for the transfer

You can download the runtime application file to the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal using:

- Ethernet
- A direct serial connection

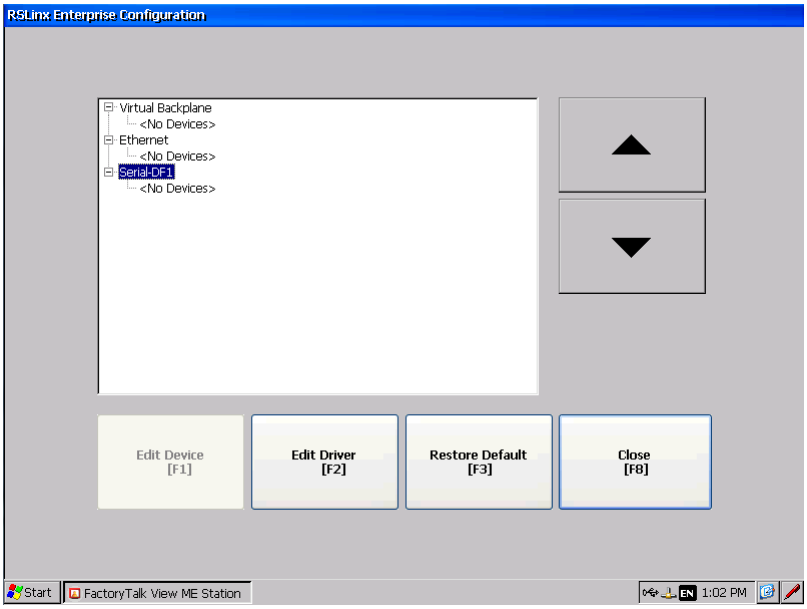
If you are using an Ethernet connection for the transfer, you don't need to set up a driver for the transfer, since the Ethernet driver is selected and loaded by default.

If you are using a serial connection for the transfer, specify and set up the driver.

You can also transfer applications to the terminal using a Flash Card. For information about this method, see the *PanelView Plus Terminals User Manual*.

To specify and set up a serial driver for the transfer

1. In the **FactoryTalk View ME Station** dialog box, click **Terminal Settings**.
2. Double-click **Networks and Communications**.
3. In the **Networks and Communications** dialog box, double-click **RSLinx Enterprise Communications**.



4. Click the Serial-DF1 driver, and then click **Edit Driver**.
5. Select **Use Auto-Configuration**, and then click **Edit**.
6. In the dialog box that opens, select **Yes**, and then click **OK**.

   Auto configuration works with most devices, including Logix5000 and PLC-5. If auto configuration is not successful for your device, return to these steps, select No, and continue to step 7.

7. Set up the driver, and then click **OK**. If you are using auto configuration, skip this step.

Set up a driver for the transfer on the development computer

On the development computer, set up the RSLinx Enterprise driver that you will use to download your application to the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal.

Use one of these drivers for the transfer:

- **Serial-DF1** — Use for a serial transfer.

- **Ethernet** — Use with an Ethernet connection.

For information about setting up drivers in RSLinx Enterprise, see RSLinx Help.

Download applications and Windows TrueType fonts

Use the Transfer Utility to download your runtime application and Windows TrueType font files from the development computer to the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal.

Runtime applications have the extension .mer. Windows TrueType font files have the extension .ttf or .ttc.

For information about creating the runtime application file, see Create runtime applications on page 221.

About the download

You can use a serial or Ethernet connection between the development computer and the PanelView Plus or PanelView Plus CE terminal destination. You must use one of the drivers listed in the previous section for the download.

You can download while an application is running on the runtime computer.

You can download:

- Multiple applications (one at a time) to the same runtime computer.
- A new copy of the application currently running on the runtime computer, for use the next time the application is started.

If the download process fails or is canceled, the application file will be deleted from the destination directories. Make a copy of the application file before you begin and make sure there is enough storage space on the destination computer.

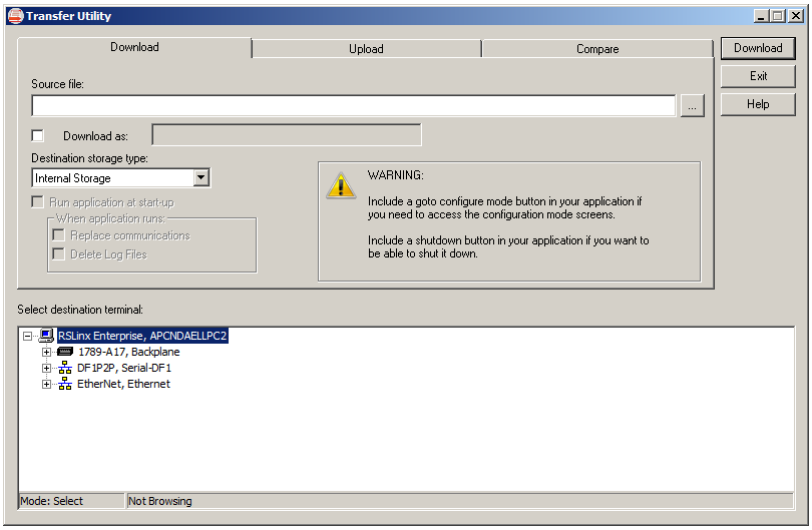
Serial downloads

To perform a serial download, make sure the terminal is connected to the development computer using the correct cable. Connect a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal to the PC using the Allen-Bradley serial cable 2711-NC13.

To start the Transfer Utility tool

On the development computer, do one of the following:

- In FactoryTalk View Studio, from the **Tools** menu, select **Transfer Utility**.
- From the Windows Start menu, select **Programs > Rockwell Software > FactoryTalk View > Tools**, and then click **ME Transfer Utility**.



For details about using the utility, see the utility's Help.

Upload applications from the PanelView Plus 7, PanelView Plus 6, PanelView Plus, or PanelView Plus CE terminal

Use the Transfer Utility to upload your runtime application from the PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal to the development computer. Runtime applications have the extension .mer.

Any password changes that were made while the application was running are saved in the .mer file and will be uploaded.

If the upload process fails or is canceled, the application file will be deleted from the destination directory. Make sure there is enough storage space on the destination computer.

About the upload

You can upload while an application is running on the runtime computer. You can upload an existing copy of the application currently running on the runtime computer.

Note: PanelView Plus 7 or PanelView Plus 6 terminals cannot process a Gradient Fill that uses a Diagonal Up or Diagonal Down direction, nor can the PanelView Plus 7 or PanelView Plus 6 terminal apply a Gradient Fill to a rotated object. While running an MER on a PanelView Plus 7 or PanelView Plus 6 terminal, the gradient attributes will be animated using the gradient fill starting color as the object's solid color background.

When running the MER on a computer, the system can process all gradient fills and this warning does not apply.

Serial uploads

To perform a serial upload, make sure the terminal is connected to the development computer using the correct cable. Connect a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal to the PC using the Allen-Bradley serial cable 2711-NC13.

For details about performing the upload, see Help for the Transfer Utility.

Compare applications

You can also use the Transfer Utility tool to compare an application on the development computer with an application on the terminal. The comparison tool can tell you whether the files are identical or different. The comparison tool detects differences using a binary checksum. It is not possible to list individual differences between the files.

Use your application

This chapter describes:

- Log in and log out
- Change passwords
- Add a user or group and delete a user or group
- Modify group membership
- Unlock users
- Enable and disable users
- Change user properties
- Enter numeric and string values
- Change tag values
- View tag data
- View alarms and messages
- View information about runtime communication errors
- Change languages

For information about navigating between displays, see Set up display navigation on page 213.

For information about navigating between and using the graphic objects in a display, see Set up how objects are used at run time on page 392.

Log in to the application

An application's security configuration may contain native FactoryTalk Security users or Windows-linked users. Windows-linked user's credentials are contained on either the local PC or in a domain. To support user authentication in a Windows domain, additional PanelView Plus terminal configuration is required.

Domain authentication

FactoryTalk View ME 8.0 and later supports PanelView Plus 7, and PanelView Plus 6 domain authentication against Windows Server 2012, Windows Server 2008, and Windows Server 2003 domains in the following mechanism:

- LDAP (Lightweight Directory Access Protocol)
- LDAP over SSL (Secure Sockets Layer)

For details, see Configure FactoryTalk View ME 8.0 and later terminals for Domain authentication on page 258.

FactoryTalk View ME releases prior to 8.0 support domain authentication against Windows Server 2000, and Windows Server 2003 domains. For details, see Configure FactoryTalk View ME prior to 8.0 terminals for Domain authentication on page 262.

Configure FactoryTalk View ME 8.0 and later terminals for Domain authentication

To configure LDAP settings on a FactoryTalk View ME 8.0 or later terminal

1. In the **FactoryTalk View ME Station** dialog box, click **Terminal Settings.**
2. Double-click **Networks and Communications**.
3. Double-click **LDAP Configuration.**
4. On FactoryTalk View ME 8.1 or later terminals, select one of the following **Authentication Mode** options:
   - **Use Windows and LDAP only authentication** to use Windows authentication mode to log in first. If Windows authentication fails, LDAP without SSL authentication mode will be used to log in.
   - **Use LDAP only authentication** to use LDAP without SSL authentication mode.
   - **Use LDAP over SSL authentication** to use LDAP over SSL authentication mode.
5. On FactoryTalk View ME 8.0 terminals, select one of the following **Use SSL** options:
   - **Yes** to use LDAP over SSL authentication mode.
   - **No** use LDAP without SSL authentication mode.
6. Do one of the following:

- In the **Server FQDN** box, enter FQDN (fully qualified domain name), for example, *FTV1TT45.domain08r2.domain03.com.*

  Note: FQDN is a DNS name that uniquely identifies the computer on the network. By default, it is a concatenation of the host name, the primary DNS suffix, and a period.

  You can find the FQDN from the **Network Identification** tab of the the properties page for **My Computer** on the Domain server.

  If SSL is enabled, you need to have the root certificate on your local terminal. For more information about obtaining root certificate, see To obtain a root certificate on page 260.

- In the **DNS-Style Domain Name** box, enter the domain name, for example, *domain08r2.domain03.com.*

The **Port** field is automatically filled.

7. On FactoryTalk View ME 8.1 or later terminals, select one of the following **Group Membership** options:

   - **Use user attribute (faster)** - Security subsystem will only evaluate domain group membership against the domain group(s) to which the user explicitly belongs. Nested domain group membership will not be evaluated. This provides much faster domain authentication than the **Use nested groups** option. When using this option, it is critical that the domain group(s) to which the target user community belongs is(are) added to FactoryTalk Security explicitly, or added to a native FactoryTalk group.
   - **Use nested groups (slower)** - Security subsystem will evaluate domain group membership by querying the domain. The domain query returns a list of all the groups to which the user belongs. User *memberof* attribute will not be evaluated. This provides slower but more complete evaluation of a user's domain group membership. When using this option, it is recommended that the domain group(s) to which the target user community belongs is(are) added to FactoryTalk Security explicitly, or added to a native FactoryTalk group.

     For example, User A is a member of domain group Line1, and User A *memberof* attribute explicitly lists Line1. User B is a member of domain group Shift3, and User B memberof attribute explicitly lists Shift3. Shift3 is a subgroup of Line1. The HMI designer adds the domain group Line1 to FactoryTalk Security, and adds and configures the group in ME Runtime Security (A through P codes). On the PanelView Plus 7, or PanelView Plus 6 terminal:

     - When the HMI designer selects **Use user attribute (faster)**, at runtime, User A can successfully authenticate; but User B cannot authenticate because domain group Shift3 is subgroup

of Line1, and Shift3 was not explicitly added to the security configuration.

- When the HMI designer selects **Use nested groups (slower)**, at runtime, User A and User B can successfully authenticate. User B can successfully authenticate because domain group Shift3 is subgroup of Line1. The domain query will return Line1 and Shift3 when evaluating domain group membership for User B.

8. Click **OK** to save the changes and close the window.

To obtain a root certificate

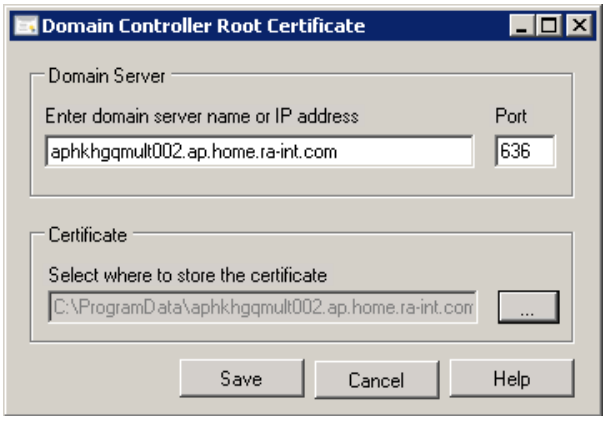
In the Windows domain controller, if you use LDAP over SSL to do authentication, you need to have the root certificate on your local terminal. You can use Domain Controller Root Certificate utility to import the certificate from remote domain server to your computer, and then transfer the certificate to the PanelView Plus 7, or PanelView Plus 6 terminal.

Note: To correctly run Domain Controller Root Certificate utility, make sure .NET Framework version 3.5 or higher is already installed on your computer.

You can use the Domain Controller Root Certificate utility to obtain certificates only when the utility is installed on a computer that is in the domain.

To save a root certificate on a local computer

1. In FactoryTalk View ME Studio, select **Tool > Domain Certificate**. **Domain Controller Root Certificate** window opens.



2. In the **Domain Server** area, complete the following fields:

- In the **Enter domain server name or IP address** field, enter the server name or IP address of the domain server. If the computer is already in a domain, the utility automatically detects and shows the domain server address in this field.
- In the **Port** field, enter the port of the domain server for LDAP over SSL. The default value is 636.

3. In the **Certificate** area, click the **Browse** (...) button to specify where the certificate file will be stored. The default location is:

   - (Windows XP) **C:\Documents and Settings\All Users\Application Data**
   - (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\ProgramData**

   The default file name is *domainserver.cer*, where *domainserver* is the domain server name or IP address.

4. Click **Save** to complete and close the window.

To import a root certificate on a FactoryTalk View ME 8.0 or later terminal

1. Copy the certificate file to a removable device.
2. Plug the removable device, containing the certificate file, into the terminal.
3. On the terminal, select **Start > Settings > Control Panel > Certificates**.
4. In the **Certificates** dialog box, click **Import**.

5. In the **Import Certificate or Key** dialog box, select **From a File**, and click **OK**.

6. In the **Select a Certificate File** dialog box, select the certificate file, and click **OK**.

If the import is successful, the certificate file shows in the lists of the certificates in the **Certificates** window.

Configure FactoryTalk View ME prior to 8.0 terminals for Domain authentication

On the terminal

Make sure you have a **Primary DNS**, and **Primary WINS** defined in the PanelView Plus terminal

On the Windows 2003 domain controller

Navigate to **Start > All Programs > Administrative Tools > Domain Controller Security Policy > Local Policies > Security Options**, and set the following:

- Domain member: Digitally encrypt or sign secure data channel (always): DISABLED
- Domain member: Digitally encrypt secure data channel (when possible): ENABLED
- Domain member: Digitally sign secure data channel (when possible): ENABLED
- Microsoft network client: Digitally sign communications (always): DISABLED
- Microsoft network client: Digitally sign communications (if server agrees): ENABLED
- Microsoft network server: Digitally sign communications (always): DISABLED
- Microsoft network server: Digitally sign communications (if client agrees): ENABLED
- Network security: LAN Manager Authentication Level: Send LM & NTLM - use NTLM v2 session security if negotiated
- Network security: LDAP client signing requirements: Negotiate Signing

Access network resources from a terminal

To access network resources (printers, network shares) it is necessary to provide authentications credentials for the PanelView Plus terminal. These credentials are independent of the currently logged in user in the HMI application.

To provide access to network resources when using a PanelView Plus 7, PanelView Plus 6, PanelView Plus, or PanelView Plus CE terminal

1. In the **FactoryTalk View ME Station** dialog box, click **Terminal Settings**.
2. Double-click **Networks and Communications**.
3. Double-click **Network Connections**.
4. Double-click **Network Identification**.
5. Type a user name, password, and domain name, and then click **OK**.

Log in to the application

Users log in using the **Login** button. The Login button opens a dialog box that allows the user to enter credentials.

To log in, both the **Runtime Security** and **FactoryTalk Security**

configuration must contain the individual user account, or a group of which the user account is a member.

For information about setting up user accounts and passwords, see Set up security on page 175.

Note: When adding users and groups to FactoryTalk security, it is important to remember that a user cannot log in to the running application unless the user or group is configured in **Runtime Security**.

4.00 and later applications

To log in, the **ME Runtime 4.00 and later** tab in **Runtime Security** configuration must contain either the individual user account, or a group of which the user is a member.

3.20 and earlier applications

To log in, the **ME Runtime 3.20 and earlier** tab in **Runtime Security** configuration must contain either the individual user account, or a group of which the user is a member.

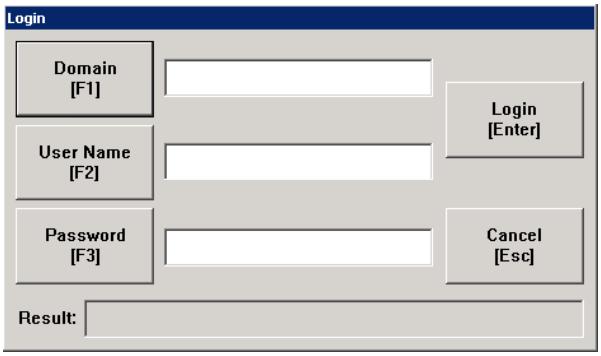
If a user account is disabled, or locked, the user cannot successfully log in until the user account is enabled or unlocked

To log in

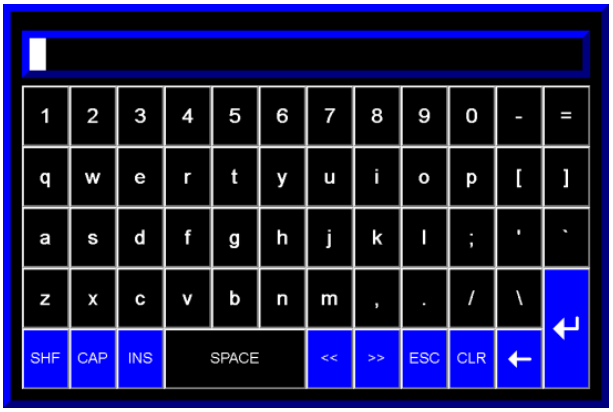
1. Press the **Login** button. The **Login** window opens.

Note: At runtime:

- If the **Visible** check box is clear in the **General** tab of the **Login Button Properties** window, the **Domain** box is hidden in the **Login** window.
- If both the **Visible** check box and the **Disable** check box are selected in the **General** tab of the **Login Button Properties** window, the **Domain** box is read-only in the **Login** window.
- If the **Visible** check box is selected, and the **Disable** check box is clear in the **General** tab of the **Login Button Properties** window, the **Domain** box can be edited in the **Login** window.
- If there are only FactoryTalk users in the application, the **Domain** box is usually hidden.



2. Press the **Domain** button, or press **F1** on an external keyboard. The string pop-up keyboard opens. For details about using the keyboard, see Use the string pop-up keyboard on page 283.



Type the domain name in the string pop-up keyboard, or on an external keyboard, and then press **Enter**.

3. Press the **UserName** button, or press **F2** on an external keyboard.Type your user name in the string pop-up keyboard, or on an external keyboard, and then press **Enter**.

If the **Hide User Name Entry** check box is selected in the **General** tab of the **Login Button Properties** window, the user name entered here is masked by #

For 4.00 and later runtime applications, the name is not case sensitive. For RSView 3.20 and earlier applications, the name must use ALL CAPS.

4. To enter the password, press the **Password** button, or press **F3** on an external keyboard. Type the password in the string pop-up keyboard, or on an external keyboard, and then press **Enter**. For 4.00 and later runtime applications, the password is case sensitive. For RSView 3.20 and earlier applications, the password is not case sensitive.

5. To close the **Login** window and complete the login, press **Enter**.

What happens when a user logs in

When a user logs in:

- If the previous user did not log out, the previous user is logged out now. If a logout macro is set up for the previous user, the logout macro runs, assigning values to tags. If the previous user belongs to a group, and a logout macro is set up for the group, the logout macro runs.
- The new user is logged in.
- If a login macro is set up for the new user, the macro runs, assigning values to tags. If the new user belongs to a group, and a login macro is set up for the group, the login macro runs.

Problems with logging in

Login is unsuccessful under these circumstances:

- If the graphic display changes remotely before the user has finished logging in, the login is cancelled.
- If the entered user name does not match a user account configured in **Runtime Security**
- If the entered user name is not a member of a group configured in **Runtime Security**.
- If the entered user password does not match the user account password configured in **Runtime Security**.
- If the user account is disabled or locked

- If a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal's time is not synchronized with the domain controller, domain users cannot log in on the terminal. To enable the users to log in, synchronize the terminal's time with the domain controller.

Change passwords

You can use the **Password** button to change password at runtime. Any password changes made at run time are saved in the .mer file.

The **Password** button supports two modes of runtime operations:

- Allows the user to modify their own password
- Allows the user to modify *any* user password

Note: When designing the application in FactoryTalk View Studio, you must consider which users and groups can access this button, and how to control that access.

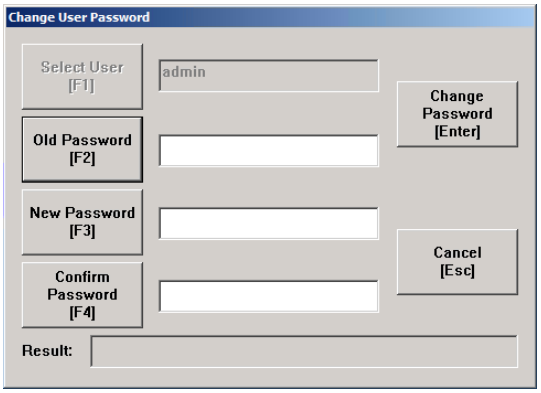
The Password button operational mode is configured in FactoryTalk View Studio, and cannot be changed at runtime.

Note:
- For 5.00 and later applications, it is recommended that you can convert the runtime application mer file to a development application in order to preserve password changes the next time the runtime application file is created.
- For versions prior to 5.00, it is recommended that when passwords are changed at run time, the same password changes are made on the development computer. Otherwise, the next time you create the .mer file, the password changes will be lost. For more information, see Convert runtime application files to development applications on page 226.
- For 3.20 and earlier applications, you cannot change passwords in FactoryTalk View ME Station. To change a password for a FactoryTalk View user, use the **Runtime Security** editor in FactoryTalk View Studio, and then recreate the runtime application and download the .mer file again. To change a password for a Windows user, use the Windows Control Panel.
- The passwords for Windows-linked users can only be changed in Windows.

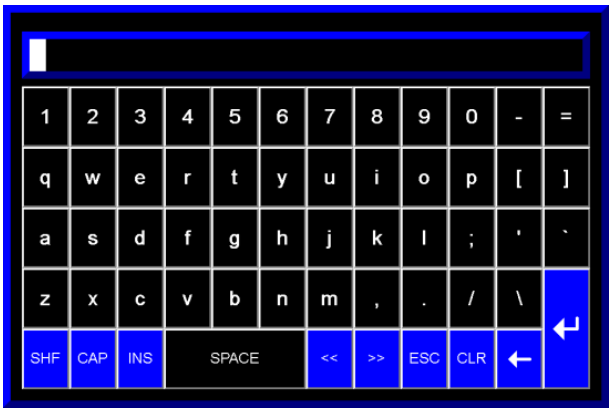
To change your current password

1. Press the **Password** button.

The **Change User Password** window opens.



2. Press the **Old Password** button, or press **F2** on an external keyboard.The string pop-up keyboard opens. For details about using the keyboard, see Use the string pop-up keyboard on page 283.



Type your old password in the string pop-up keyboard, or on an external keyboard, and then press **Enter**.The password is case sensitive.

3. Press the **New Password** button, or press **F3** on an external keyboard.

4. Type the new password in the string pop-up keyboard, or on an external keyboard, and then press **Enter**.

5. Press the **Confirm Password** button, or press **F4** on an external keyboard.

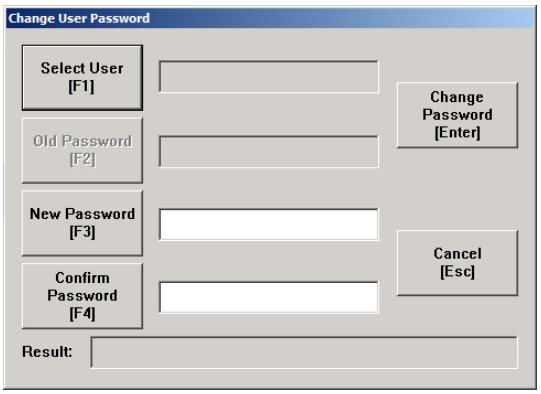
6. Type the new password again, and then press **Enter**.

7. To close the **Change Password** window and complete the change, press **Cancel**.

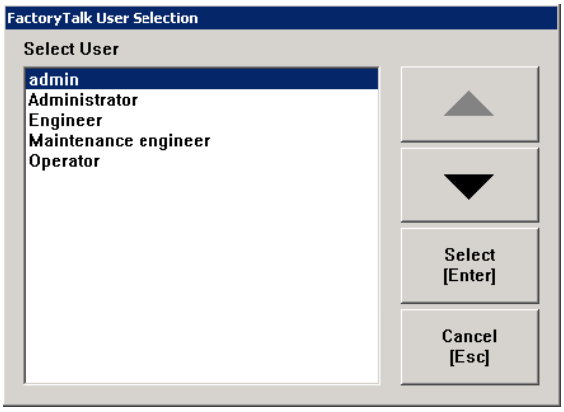
To change any user password

1. Press the **Password** button.

   The **Change User Password** window opens.



2. Press the **Select User** button, or press **F1** on an external keyboard. The **FactoryTalk User Selection** window opens.



3. Press the **Up Arrow** or **Down Arrow** to select a user, and press the **Select** button, or press **Enter** on an external keyboard.

4. Press the **New Password** button, or press **F3** on an external keyboard.

5. Type the new password in the string pop-up keyboard, or on an external keyboard, and then press **Enter**.

6. Press the **Confirm Password** button, or press **F4** on an external keyboard.

7. Type the new password again, and then press **Enter**.

8. To close the **Change Password** window and complete the change, press **Cancel**.

Log out

When the current user logs out, if a logout macro is assigned to the user, the macro runs. If the user belongs to a group, and a logout macro is set up for the group, the logout macro runs.

After the current user is logged out, the DEFAULT user is logged in. If a login macro is assigned to the DEFAULT user, the macro runs.

You can also set up the application to automatically log out the current user after a specified period of inactivity. For more information, see Log out automatically on page 187.

To log out

- Press the **Logout** button.

Add a user or group

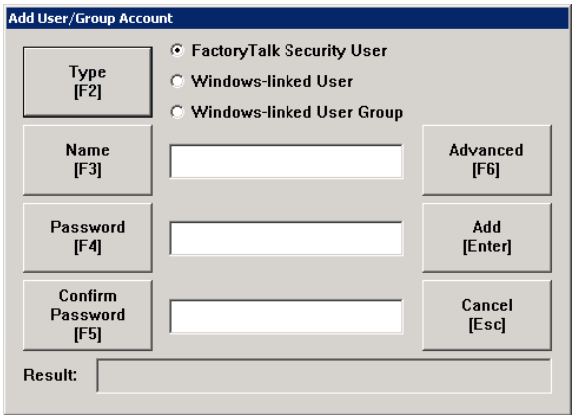
Use the **Add User/Group** button to add a FactoryTalk security user, a Windows-linked user, or a Windows-linked group to the current running application. It is not possible to add a new FactoryTalk Security group to a running application.

Note: When designing the application in FactoryTalk View Studio, you must consider which users and groups can access this button, and how to control that access.

Newly added FactoryTalk Security users, Windows-linked users, and Windows-linked groups cannot log in to the system *untill* the added user, or Windows-linked group is made a member of an existing FactoryTalk group, which is configured with runtime security code(s) in **Runtime Security**.

To add a FactoryTalk security user

1. Press the **Add User/Group** button to open the **Add User/Group Account** dialog box.



2. Press the **Type** button, or press **F2** on an external keyboard to select **FactoryTalk Security User.**

3. Press the **Name** button, or press **F3** on an external keyboard. The string pop-up keyboard opens.

   Type the user name in the string pop-up keyboard, or on an external keyboard, and then press **Enter**. The user name is not case sensitive.

4. Press the **Password** button, or press **F4** on an external keyboard.

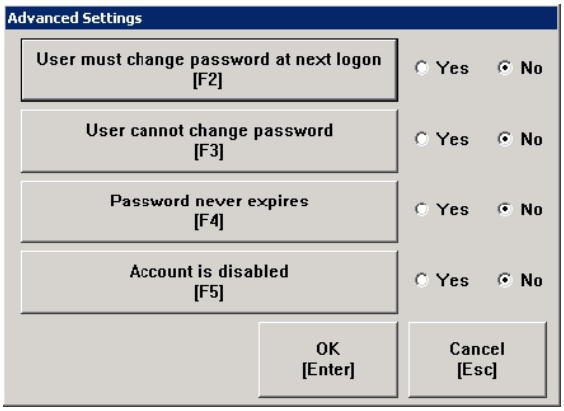
5. Type the password in the string pop-up keyboard, or on an external keyboard, and then press **Enter**.

   The password length must meet the Password Policy, which is defined in the FactoryTalk Security Policy. The password is case sensitive.

6. Press the **Confirm Password** button, or press **F5** on an external keyboard.

   Type the password again, and then press **Enter**.

7. *Optional* - Press the **Advanced** button, or press **F6** on an external keyboard. The **Advanced Settings** window opens.



   Press the following buttons to adjust the advanced settings:

   - **User must change password at next logon**
   - **User cannot change password**
   - **Password never expires**
   - **Account is disabled**

   All the settings are set to **No** by default.

8. To close the **Advanced Settings** window and complete the change, press **Enter**.

9. To close the **Add User/Group Account** window, press **Cancel**.

To add a Windows-linked user or group

1. Press the **Add User/Group** button to open the **Add User/Group Account** dialog box.
2. Press the **Type** button, or press **F2** on an external keyboard to select **Windows-linked User**, or **Windows-linked User Group.**

   When adding a Windows-linked user, or a Windows-linked user group, the system will verify whether the user or group exists in the Windows domain, Windows User Accounts. If the user or group does not exist in the Windows domain, Windows User Accounts, it cannot be added.
3. Press the **Name** button, or press **F3** on an external keyboard. The string pop-up keyboard opens.

   Type the user name in the string pop-up keyboard, or on an external keyboard, and then press **Enter** to save. The user name is not case sensitive.

   Note: On the PanelView Plus 7 and PanelView Plus 6 terminals, there is a five-minute threshold when adding a Windows-linked user, or a Windows-linked user group.

   When you add a Windows-linked user, or a Windows-linked user group for the first time, a window prompts you to enter an authorized user name and password.

   Within five minutes after a Windows-linked user, or a Windows-linked user group is successfully added, you can add another Windows-linked user, or Windows-linked user group without entering an authorized user name and password.

   Beyond five minutes after a Windows-linked user, or a Windows-linked user group is successfully added, a window will prompt you to enter an authorized user name and password again before you can add another Windows-linked user, or Windows-linked user group.
4. To close the **Add User/Group Account** window, press **Cancel**.

Delete a user or group

The administrator can use the Delete User/Group button to delete a FactoryTalk security user, a Windows-linked user, or a Windows-linked group from the current running application. It is not possible to delete a FactoryTalk Security group from the running application.

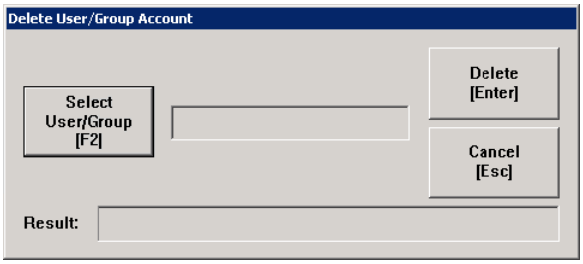
Note: When designing the application in FactoryTalk View Studio, you must consider which users and groups can access this button, and how to control that access.

If a Windows-linked user group or a Windows-linked user is deleted, the group or user will be removed from the current running application, but will not be removed from Windows.

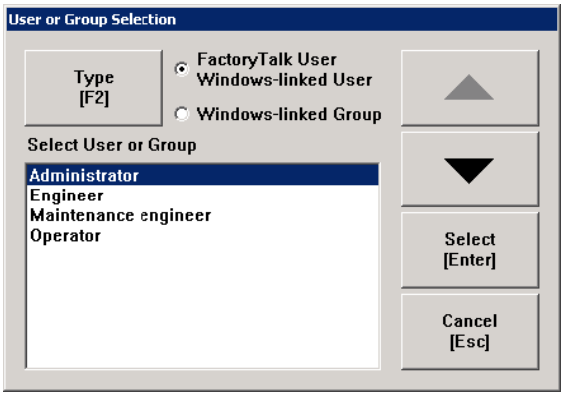
DEFAULT user is not allowed to delete a user or group.

To delete a user or group

1. Press the **Delete User/Group** button to open the **Delete User/Group Account** dialog box.



2. Press the **Select User/Group** button, or press **F2** on an external keyboard to open the **User or Group Selection** dialog box,



3. Press the **Type** button, or press **F2** on an external keyboard to select **FactoryTalk Security User, Windows-linked User**, or **Windows-linked Group**.

4. Press the **Up Arrow** or **Down Arrow** button to select a user, and press the **Select** button, or press **Enter** on an external keyboard.

5. To close the **Delete User/Group** window and complete the change, press **Cancel**.

Modify a user or group membership

The administrator can use the **Modify Group Membership** button to change a FactoryTalk user, a Windows-linked user, or a Windows-linked group membership in the current running application.

Note: When designing the application in FactoryTalk View Studio, you must consider which users and groups can access this button, and how to control that access.

- If a user or group is added to a group, the user or group inherits the A-P security codes of the group.
- If a user or group is removed from a group, the user or group no longer inherits the A-P security codes of that group.
- If a user or group is a member of multiple FactoryTalk Security groups:

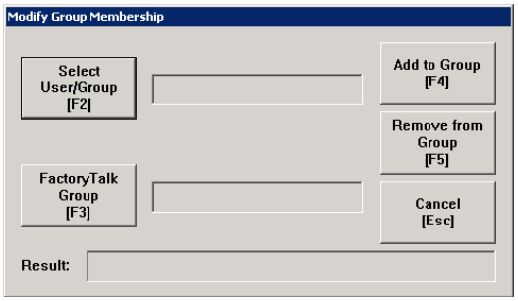
  The user or group inherits the A-P security codes shared by the multiple FactoryTalk Security groups. For example, if a user or group belongs to both Group One and Group Two; Group One has the security codes of A, B, C, and Group Two has the security codes of B, C, D; and then the user or group only inherits the security codes of B, C.

  When a user or group is removed from one FactoryTalk Security group, the user or group is still a member of other FactoryTalk Security groups.

  When a user or group is no longer a member of *any* FactoryTalk Security group, it is not possible for the user or group users to log in to the running application.

To Modify group membership

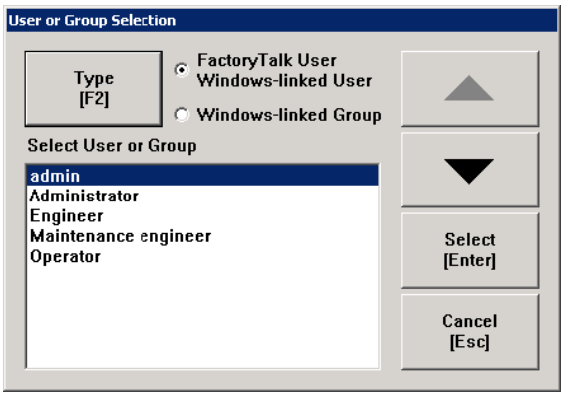
1. Press the **Modify Group Membership** button to open the **Modify Group Membership** dialog box.



2. Press the **Select User/Group** button, or press **F2** on an external keyboard to open the **User or Group Selection** dialog box.

3. Press the **Type** button, or press **F2** on an external keyboard to select **FactoryTalk User, Windows-linked User**, or **Windows-linked Group**.

4. Press the **Up Arrow** or **Down Arrow** button to select a user, and press the **Select** button, or press **Enter** on an external keyboard.



5. Press the **FactoryTalk Group** button to open **FactoryTalk Group Selection** dialog box.

6. Press the **Up Arrow** or **Down Arrow** button to select a group, and press the **Select** button, or press **Enter** on an external keyboard.

7. To add the user or group to the selected FactoryTalk group, press **Add to Group**, or press **F4** on an external keyboard.

   To remove the user or group from the selected FactoryTalk group, press **Remove from Group**, or press **F5** on an external keyboard.

Unlock a user

The administrator can use the Unlock User Account button to unlock a FactoryTalk user account, which has been locked.

Note: When designing the application in FactoryTalk View Studio, you must consider which users and groups can access this button, and how to control that access.

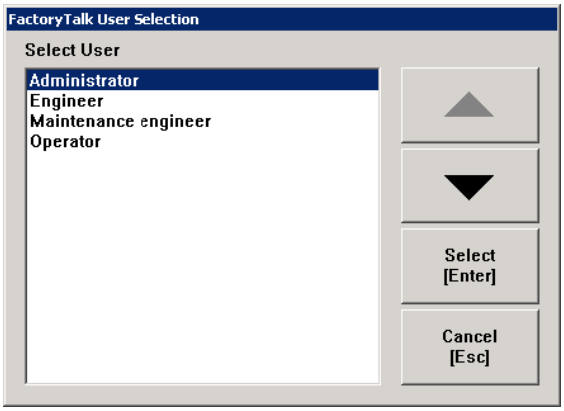
When a user account is locked, the user cannot log in the system.

If a FactoryTalk user exceeds incorrect password login attempts, the user account will be locked. When the user account is locked, the user cannot log in to the system even with correct password before the user account is unlocked.

You cannot use this button to unlock a Windows-linked user. Only a Windows Domain administrator can unlock a Windows-linked user from a domain computer.

To unlock a user

1. Press the **Unlock User Account** button to open the **Unlock User Account** dialog box.
2. Press the **Select User** button, or press **F2** on an external keyboard to open the **FactoryTalk User Selection** dialog box.



3. Press the **Up Arrow** or **Down Arrow** button to select a user, and press the **Select** button, or press **Enter** on an external keyboard.
4. To close the **Unlock User Account** window and complete the change, press the **Unlock** button, or press **Enter** on an external keyboard.

Disable a user

The administrator can use the Disable User button to disable a FactoryTalk user account from the current running application.

Note: When designing the application in FactoryTalk View Studio, you must consider which users and groups can access this button, and how to control that access.

When a user account is disabled, the user cannot log in the system.

You cannot use this button to disable a Windows-linked user. Only a Windows Domain administrator can disable a Windows-linked user from a domain computer.

To disable a user

1. Press the **Disable User** button to open the **Disable User Account** dialog box.
2. Press the **Select User** button, or press **F2** on an external keyboard to open the **FactoryTalk User Selection** dialog box.

3. Press the **Up Arrow** or **Down Arrow** button to select a user, and press the **Select** button, or press **Enter** on an external keyboard.

4. To close the **Disable User Account** window and complete the change, press the **Disable** button, or press **Enter** on an external keyboard.

Enable a user

The administrator can use the Enable User button to enable a disabled FactoryTalk user account from the current running application.

Note: When designing the application in FactoryTalk View Studio, you must consider which users and groups can access this button, and how to control that access.

When a disabled user is enabled, the user can log in the system again.

You cannot use this button to enable a Windows-linked user. Only a Windows Domain administrator can enable a Windows-linked user from a domain computer.

To enable a user

1. Press the **Enable User** button to open the **Enable User Account** dialog box.

2. Press the **Select User** button, or press **F2** on an external keyboard to open the **FactoryTalk User Selection** dialog box.

3. Press the **Up Arrow** or **Down Arrow** button to select a user, and press the **Select** button, or press **Enter** on an external keyboard.

4. To close the **Enable User Account** window and complete the change, press the **Enable** button, or press **Enter** on an external keyboard.

Change User Properties

The administrator can use the **Change User Properties** button to modify a FactoryTalk user's properties in the current running application.

Note: When designing the application in FactoryTalk View Studio, you must consider which users and groups can access this button, and how to control that access.

To modify a user's properties

1. Press the **Change User Properties** button to open the **Change User Properties** dialog box.

2. Press the **Select User** button, or press **F2** on an external keyboard to open the **FactoryTalk User Selection** dialog box.

3. Press the **Up Arrow** or **Down Arrow** button to select a user, and press the **Select** button, or press **Enter** on an external keyboard.

   The **FactoryTalk User Selection** dialog box only shows the users already configured in FactoryTalk Directory and packed in the application.

4. Press the following buttons to adjust the advanced settings:

   - **User must change password at next logon**
   - **User cannot change password**
   - **Password never expires**
   - **Account is disabled**

5. Press **Change** to save the changes.

Enter numeric values

The operator can enter or ramp numeric values at run time using the Numeric Input Enable button or the numeric input cursor point.

When the operator presses the button or activates the cursor point, the numeric pop-up keypad or scratchpad opens. If you set up the button or cursor point to ramp, pressing the object gives it focus, but does not open a pop-up window.

To use the numeric pop-up scratchpad, a keyboard must be attached to the runtime computer, or the terminal must be a keypad terminal.

For information about setting up the Numeric Input Enable button and numeric input cursor point, see Help.

You can also use a Ramp button to ramp numeric values. For details, see Help for the button.

Activate the cursor point

When the numeric input cursor point has focus, the operator can activate the cursor point by pressing any of these keys on the keyboard or keypad:

- Numbers from 0 to 9
- The minus sign (-) or decimal point (.)
- The **Enter** key, or an enter button
- The Backspace key, or a backspace button

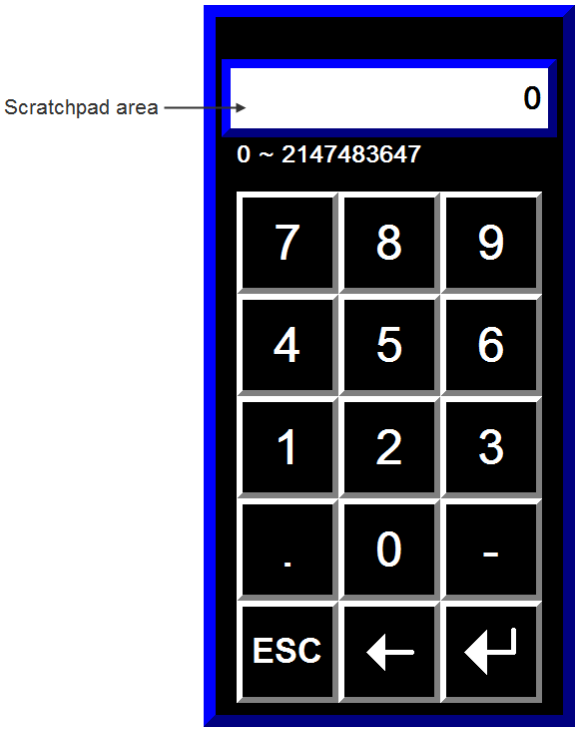
When the operator activates the numeric input cursor point, the numeric pop-up keypad or scratchpad opens.

Ramp numeric values

If you set up the **Numeric Input Enable** button or numeric input cursor point to ramp values, the operator presses the object to give it focus. When the object has focus, the operator can press a move up or move down button, or the Up Arrow or Down Arrow key on a keyboard or keypad, to ramp the value at the **Value** connection.

Use the numeric pop-up keypad

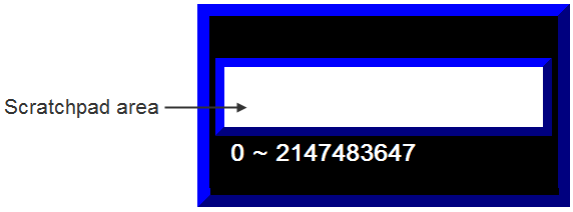
The keypad can accept up to 17 digits, including the decimal point, leading zero, and minus sign.



When the keypad is open, no other objects in the graphic display can accept input.

Use the numeric pop-up scratchpad

The scratchpad can accept up to 17 digits, including the decimal point, leading zero, and minus sign.



The scratchpad does not contain any buttons. If the runtime computer does not have an external keyboard or keypad attached, the operator will be unable to enter values or close the scratchpad.

When the scratchpad is open, no other objects in the graphic display can accept input.

Use buttons and keys with the numeric pop-up windows

You can use the following buttons and their keyboard or keypad equivalents with the numeric pop-up keypad. For the pop-up scratchpad, you can use the keys on an external keyboard or keypad only.

Use this button or key	To do this
Decimal (.)	Type a decimal point. This button is visible only if the decimal point type for the Numeric Input Enable button or numeric input cursor point is Implicit.
Minus (-)	Toggle the value between positive and negative.
ESC	Close the pop-up window without writing the value to the object's **Value connection**.
Backspace	Delete the right-most digit in the scratchpad. If no digits are left, the minus sign, if any, is removed.
Enter	Close the pop-up window and write the value to the object's **Value connection**. If the **Optional Expression** connection is assigned to the button or cursor point, FactoryTalk View calculates the value of the expression and writes the result to the **Value connection**. For details, see Use write expressions on page 490. If **Enter key handshaking** is set up for the button or cursor point, the object's **Enter connection** is set to 1 and the handshaking timer begins timing. For information about using **Enter key handshaking**, see Methods of Enter key handshaking on page 400.

Use this button or key	To do this
Delete	Clear the scratchpad. There is no Delete button in the pop-up keypad, but you can use the Delete key on an external keyboard or keypad.

How values are ramped

If the button or cursor point is being used to ramp a value at the **Value** connection:

- When the tag assigned to the **Value** connection is an integer tag, but the ramp value is a floating point value, the ramp value is added to (or subtracted from) the **Value** connection value, and then the result is rounded and written to the **Value** connection.

  For information about how values are rounded, see How values are rounded on page 98.

- If the operator presses and holds down the move up or move down button, or the Up Arrow or Down Arrow key on the keyboard or keypad, the button or key goes into auto repeat mode. The ramp value is added to (or subtracted from) the last value sent to the **Value** connection.

  For more information about auto repeat mode, see To set up auto repeat for a button, use one of these methods on page 399.

- If ramping the button or cursor point would cause the value at the **Value** connection to exceed the maximum value, or be less than the minimum value, a message is written to the **Diagnostics List** and the value at the **Value** connection is not changed.

How values are calculated

When the pop-up keypad or scratchpad has focus and the operator presses the Enter button, the value that is sent to the **Value** connection depends on how the button or cursor point is set up.

- The value the operator enters is compared to the minimum and maximum range for the object. If the value is within the range, the value is written to the **Value** connection.

  If the **Optional Expression** connection is assigned, and the original value is within the range but the expression result is a value outside the range, the value is still written to the **Value** connection.

- If the decimal point type is Fixed Position, with a "Digits after decimal" value that is greater than 0, the decimal point is stripped from the value before comparing it to the minimum and maximum range.

  For example, if the entered value is 9.25, the stripped value is 925.

  If the stripped value is within the range, the stripped value is sent to the **Value** connection (or substituted for the ? in the **Optional Expression**).

- If the decimal point type is Implicit, and the tag assigned to the **Value** connection uses an integer data type, floating-point values are rounded.

  If the **Optional Expression** connection is assigned, the floating-point value is substituted for the ? in the expression, and the expression result is rounded.

  For information about how values are rounded, see How values are rounded on page 98.

Problems with the numeric pop-up windows

Problems with the numeric pop-up keypad and scratchpad occur under these circumstances:

- If the graphic display changes remotely before the user has pressed the Enter button, the pop-up window closes without writing out a value.
- If the screen resolution is smaller than 124 pixels wide by 240 pixels high, the pop-up keypad cannot open.
- If the screen resolution is smaller than 124 pixels wide by 68 pixels high, the pop-up scratchpad cannot open.
- If the value is too large for the data type of the tag assigned to the **Value** connection, the pop-up window remains open and the value is not written to the connection. The scratchpad area changes to red to alert the operator of the error.
- If the value is outside the minimum and maximum range specified for the object, the pop-up window remains open and the value is not written to the connection. The scratchpad area changes to red to alert the operator of the error.
- If **Enter key handshaking** is still in effect, the pop-up window closes but the value is not written to the connection.

Enter string values

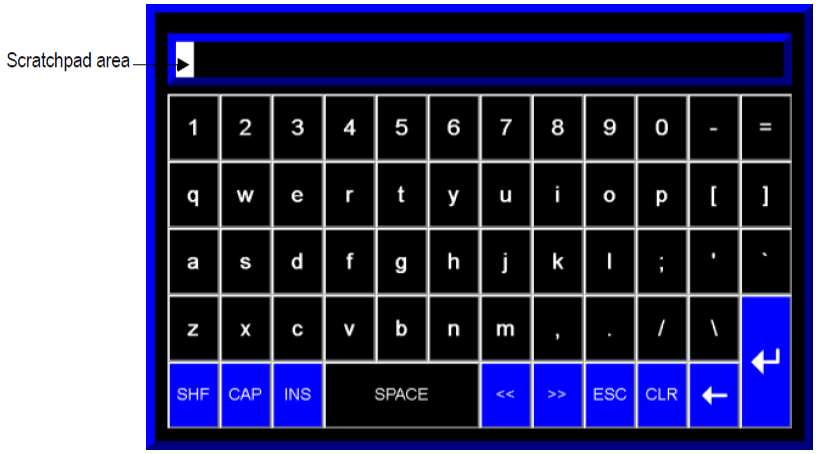
The operator can enter string values at run time using the **String Input Enable** button.

When the operator presses the button, the string pop-up keyboard or scratchpad opens, depending on how you set up the button. To use the scratchpad, a keyboard must be attached to the runtime computer.

For information about setting up the **String Input Enable** button, see Help.

Use the string pop-up keyboard

The string pop-up keyboard opens when the operator presses a **String Input Enable** button or the User or Password button in the **Login** dialog box. The pop-up is also used with the password button graphic object.



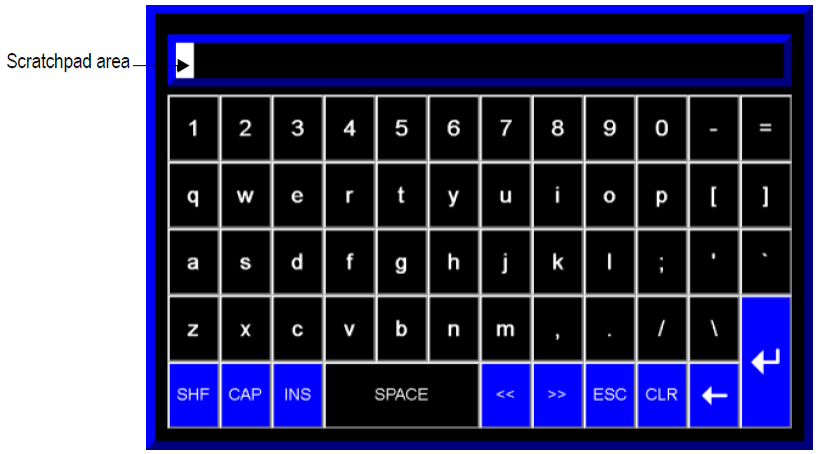
If the operator opens the pop-up keyboard by pressing a **String Input Enable** button, the number of characters the keyboard accepts depends on how you set up the button.

When the keyboard is open, no other objects in the graphic display can accept input.

Use the string pop-up character input

You can use a string pop-up character input instead of the string pop-up keyboard. With the string pop-up character input, you use the arrow keys to select the characters to input.

The string pop-up character input opens when the operator presses a **String Input Enable** button or the **User** or **Password** button in the **Login** dialog box. The pop-up is also used with the password button graphic object.



If the operator opens the string pop-up character input by pressing a **String Input Enable** button, the number of characters the input accepts depends on how you set up the button.

To use the string pop-up character input on a personal computer

1. In FactoryTalk View Studio, from the **Tools** menu, select **Options**.
2. Click the **String Pop-Up** tab.
3. Select **Use the string pop-up character input**.

To use the string pop-up character input on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, or PanelView Plus CE terminal

1. In FactoryTalk View ME Station, click **Terminal Settings.**
2. Double-click **Input Devices.**
3. Select **String Pop-Up**, and then click **Enter**.
4. Specify whether to invoke the pop-up character input instead of the pop-up keyboard, and then click **OK**.

Use the string pop-up scratchpad

If the operator opens the string pop-up scratchpad by pressing a **String Input Enable** button, the number of characters the scratchpad accepts depends on how you set up the **String Input Enable** button.

The scratchpad does not contain any buttons. If the runtime computer does not have an external keyboard attached, the operator will be unable to enter characters or close the scratchpad (unless the runtime terminal is a keypad terminal). If the runtime terminal is a keypad terminal, the operator can enter numbers (not letters) in the scratchpad, and close the scratchpad.

When the scratchpad is open, no other objects in the graphic display can accept input.

Use buttons and keys with the string pop-up windows

You can use the following buttons and their keyboard equivalents with the string pop-up keyboard. For the pop-up scratchpad, you can use the keys on an external keyboard only. The string pop-up character input does not have a SHF or CAP key, and it has additional arrow keys for selecting the characters to input.

Use this pop-up keyboard button	Or this keyboard equivalent	To do this
SHF	none	Capitalize a single letter, or type a shifted character such as #.
CAP	none	Capitalize multiple letters.
INS	Insert	Toggle between insert and overstrike modes.
SPACE	Spacebar	Insert a space.
<<	Left Arrow	Move the cursor to the left.
>>	Right Arrow	Move the cursor to the right.
ESC	Esc	Close the pop-up window without writing the string to the **Login** dialog box, the **Change Password** dialog box, or the **String Input Enable** button's **Value connection**.
CLR	Delete	Clear the scratchpad.
Backspace	Backspace	Delete the character in front of the cursor.

Use this pop-up keyboard button	Or this keyboard equivalent	To do this
Enter	Enter	Close the pop-up window and write the string to the **Login** dialog box, the **Change Password** dialog box, or the **String Input Enable** button's **Value connection**. If **Enter key handshaking** is set up for the **String Input Enable** button, the button's **Enter connection** is set to 1 and the handshaking timer begins timing. For information about using **Enter key handshaking**, see Methods of Enter key handshaking on page 400.

What is written to the Value connection

When the operator presses the Enter button in the pop-up keyboard or scratchpad, the string that is sent to the **Value connection** depends on how the **String Input Enable** button is set up.

- If a fill character is set up for the button, and the operator enters fewer than the maximum number of input characters, the fill characters are placed after the string the operator enters.
  - Spaces have a hex value of 20.
  - Zeroes have a hex value of 30.
  - FF characters have a hex value of FF.
  - Null characters have a hex value of 0. The null character indicates the end of string input. It does not add to the actual string length.
- If the number of input characters is fewer than the number of characters in the length of the string tag assigned to the **Value connection**, the remaining spaces are padded with the null character.

When the string is written to the **Value connection**, the first character is placed in the high order byte of the first word at the tag address, the second character is placed in the low order byte of the first word, and so on.

Problems with the string pop-up windows

Problems with the string pop-up keyboard and scratchpad occur under these circumstances:

- If the graphic display changes remotely before the user has pressed the Enter button, the pop-up window closes without writing out a string.

- If the screen resolution is smaller than 236 pixels wide by 208 pixels high, the pop-up keyboard cannot open.
- If the screen resolution is smaller than 236 pixels wide by 44 pixels high, the pop-up scratchpad cannot open.
- If the string pop-up window is set up to accept more characters than the **Value** connection tag length, the pop-up window remains open and the string is not written to the connection. The scratchpad area changes to red to alert the operator of the error.
- If **Enter key handshaking** is still in effect, the pop-up window closes but the value is not written to the connection.

Change tag values

This section gives an overview of the graphic objects you can use to change tag values. For information about setting up the objects, see Set up graphic objects on page 389 and Help.

The operator uses these objects to start and stop plant operations, and to control machines and processes. Choose the objects that best suit your process. Set up the data source to carry out the desired actions in response to the changes in tag values.

The operator can use function keys with all of these objects except control list selectors, third-party ActiveX objects, and drawing objects with slider animation. The last three types of objects can be pressed using a mouse or touch screen.

For information about assigning function keys to graphic objects, see Assign function keys to buttons on page 393.

Important:	Do not use push buttons for emergency stops. Emergency stop buttons must be hard-wired.

You can also use macros to assign values to tags. For more information, see Use macros on page 561.

The operator can change tag values at run time using these graphic objects:

Use this graphic object	To do this
Momentary push button	Start a process or action by sending one value to the tag when pressed, and another value when released.
Maintained push button	Toggle between two values by sending one value to the tag when pressed, and a second value the next time the button is pressed and released. This button is useful for changing a setting within a machine or process, but not for starting the machine or process.
Latched push button	Start a machine or process and remain set (latched) until the process is completed, by sending a value to the tag when pressed, and retaining this value until reset (unlatched) by the **Handshake** connection.

Use this graphic object	To do this
Multistate push button	Cycle through a series of values. Each time the operator presses the button, the value for the next state is sent to the tag. When the button is in its last state, pressing it causes the button to change to its first state and write out the first state value. This button is useful when you want the operator to see and select multiple options in sequence, using a single button. The button shows the current state of a process or operation by showing a different color, caption, or image to reflect the different states.
Interlocked push button	Use a group of buttons to send values to the same tag. When the operator presses a button in the group, the button's value is sent to the tag, and the button remains highlighted as long as the tag value is the same as the button's value. Pressing a new button in the group releases the other button and sends a new value to the tag. You can also use a single Interlocked push button to send a value to a tag.
Ramp button	Increase or decrease the value of a tag by a specified integer or floating-point value. Use two Ramp buttons together to create a raise/lower control.
Numeric input enable button	Enter a numeric value and write the value to a tag. You can also use this object to ramp values.
Numeric input cursor point	Enter a numeric value and write the value to a tag. You can also use this object to ramp values.
String Input Enable button	Enter a string value and write the value to a tag.
RecipePlus button	Write values for all the ingredients in the selected recipe to a set of tags. The button works with the RecipePlus table and RecipePlus selector graphic objects.
Drawing object with horizontal or vertical slider animation	Control the value of a tag by dragging the slider object with a mouse. The pixel position of the slider is translated into a value that is written to the tag. If the value of the tag is changed externally, the position of the slider changes to reflect this.
Control list selector	Select from a list of states for a process or operation. The list is highlighted to show the current state, and the operator can scroll through the list to select a different state. The value assigned to the selected state is written to the tag. If the value of the tag is changed externally, the position of the highlight changes to reflect this.
ActiveX object	A third-party object, connected to an analog, digital, or string tag, including both HMI and data server tags. When the object's property value changes, the new value is written to the associated tag.

You can attach visibility animation to these graphic objects, to show or hide the objects based on changes in tag or expression values. For information

about visibility animation, see Set up the different types of animation on page 464.

For information about creating graphic objects, see Use graphic objects on page 331. For information about setting up graphic objects, see Set up graphic objects on page 389 and Help.

View tag data

This section gives an overview of the graphic objects you can use to show tag data. For information about setting up the objects, see Set up graphic objects on page 389 and Help.

The operator can view tag data at run time using these graphic objects:

Use this graphic object	To show this
Numeric display	Numeric tag values. For example, show the current temperature of an oven.
Numeric input cursor point	Numeric tag values. For example, show the current temperature of an oven.
String display	String tag values. For example, set up the data source to generate strings that report on the state of a process or operation, or that provide the operator with instructions about what to do next.
Bar graph	Numeric values in bar graph format. The bar graph increases or decreases in size to show the changing value.
Gauge	Numeric values in dial format. The gauge's needle moves around the dial to show the changing value.
Multistate indicator	The state of a process, on a panel that changes its color, image, or caption to indicate the current state. Each state is set up to correspond to a numeric tag value or least significant bit.
Symbol	The state of a process, using a monochrome image that changes color to indicate the current state. Each state is set up to correspond to a numeric tag value or least significant bit. This object is useful for showing the state of a process or operation at a glance.
List indicator	The state of a process, using a list of possible states with the current state highlighted. Each state is represented by a caption in the list, and is set up to correspond to a numeric tag value or least significant bit. This indicator is useful if you want to view the current state but also want to see the other possible states. For sequential processes, the list can alert the operator about what happens next in the process.
Trend	Historical or current numeric tag values, plotted against time or shown in an XY plot where one or more tags' values are plotted against another tag's values to show the relationship between them.

Use this graphic object	To show this
RecipePlus table	Current tag values and data set values of the ingredients in the selected recipe, and the number of ingredients in the recipe. The table works with the **RecipePlus** button and **RecipePlus** selector graphic objects.
Drawing object with rotation, width, height, fill, color, or horizontal or vertical position animation	Show the value of a tag using a pictorial representation that shows the current value in relation to a range of possible values. For example, use rotation animation to show the tag value as a needle's position on a dial. For color animation, assign different colors to represent different values.
ActiveX object	A third-party object, connected to an analog, digital, or string tag, including both HMI and data server tags. The data shown depends on the object.

Many of these objects can be set up to manipulate tag values using expressions, and show the expression result rather than the original tag value. For information about expressions, see Use expressions on page 475.

You can also attach visibility animation to these graphic objects, to show or hide the objects based on changes in tag or expression values. For information about visibility animation, see Set up the different types of animation on page 464.

For information about creating graphic objects, see Use graphic objects on page 331. For information about setting up graphic objects, see Set up graphic objects on page 389 or Help.

Show the date and time

To show the current date and time, create a time and date display. This object uses the operating system's date and time, in the format of the application's current language, and therefore does not require tags or expressions.

View alarms and messages

The operator can view alarms and other messages at run time using these graphic objects and graphic displays:

This information	Appears in this object	In this default graphic display	For details, see
Alarm messages	Alarm banner	[ALARM].	The [ALARM BANNER] display on page 145
Alarm messages	Alarm list	No default, although this object appears in the [ALARM MULTI-LINE] and [HISTORY] graphic libraries.	The [ALARM] display on page 144, The [ALARM MULTI-LINE] display on page 146, and The [HISTORY] display on page 148

This information	Appears in this object	In this default graphic display	For details, see
Alarm messages	Alarm status list	No default, although this object appears in the [STATUS] graphic library.	The [STATUS] display on page 147
System activity	Diagnostics list	[DIAGNOSTICS]	How the diagnostics list graphic object works on page 173
Information messages	Information message display	[INFORMATION]	How the information message display graphic object works on page 532
Local messages	Local message display	No default.	How the local message display graphic object works on page 329

The default alarm and information displays open automatically when the assigned tags match messages' trigger values. The default diagnostics display opens automatically when system activity occurs. If desired, you can set up your own graphic displays to open automatically, instead of the default displays. You can also set up any of the displays to open when an operator presses a Goto display button or selects a display in the display list selector.

The operator can acknowledge alarm and information messages. The operator can clear alarm and diagnostics messages. The operator can sort alarms and reset their status.

View information about runtime communication errors

To show communication errors in the diagnostics list object, set up message routing so that messages are sent to the FactoryTalk View Diagnostics List.

For information about setting up diagnostics message routing, see Set up FactoryTalk Diagnostics on page 161.

Change languages

You can change languages at run time. The languages available depend on what has been set up for the runtime application. There is a separate **Language Switch** button for each language that you can change to.

For information about setting up language switching, see Set up language switching on page 197.

To change languages

- Press a **Language Switch** button.

  Text strings in the application change to the language specified by the button.

Work with components

This chapter describes:

- Which editors have components
- Work with components
- Print information in components

For information on working with particular editors, see the chapters later in this guide.

Editors that have components

With some editors you enter information in a single window or a tabbed dialog box. Other editors allow you to create multiple components, such as graphic displays or message files. Each component is stored in a separate file, with its own name.

You can create components in these editors:

- **Graphics** (components include graphic displays, global object displays, and graphic libraries, each in their own folder)
- **Parameters**
- **Local Messages**
- **Information Messages**
- **Data Log Models**
- **Macros**
- **RecipePlus**

The **Explorer** window lists the components you create under the icon for the editor you used to create the component.

You can use the **Images** editor to copy bitmap images into your application (but not to create new images). Each image you copy is listed as a component under the editor.

To view a list of components for an editor

- Click the + symbol to the left of the editor icon, or double-click the editor name.

Work with components

This section describes how to perform basic operations that are common to all components.

For information on working with components in particular editors, see the chapters later in this guide.

Create components

To create a new component, do one of the following

- Drag the component icon into the workspace.
- Right-click the editor, and then click **New**.
- From the **File** menu, select **New**, and then click the type of component to create.

Open components

To open a component, do one of the following

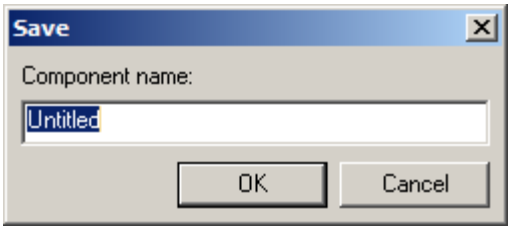
- Double-click the component.
- Right-click the component, and then select **Open**.
- Drag the component from the Explorer window to the workspace.

Save components

The Save tool is available when the active component contains unsaved changes.

To save a component

1. From the **File** menu, select **Save**, or click the Save tool.



2. If this is the first time you're saving the component, type a name in the Component name box, and then click **OK**.

Close components

To close a component

- From the **File** menu, select **Close**, or click the Close button on the component's title bar.

  Some components have a **Close** button that you can click to close the component.

  Before the component closes you are prompted to save unsaved changes, if there are any.

Add components into an application

You can use the same components in more than one application by adding components into an application.

For example, if you want to use the same graphic display in Application A and Application B, create the display in Application A, then add the graphic display component from Application A to Application B.

When you add the component into Application B, changes you make to the component in Application B are not reflected in the component in Application A.

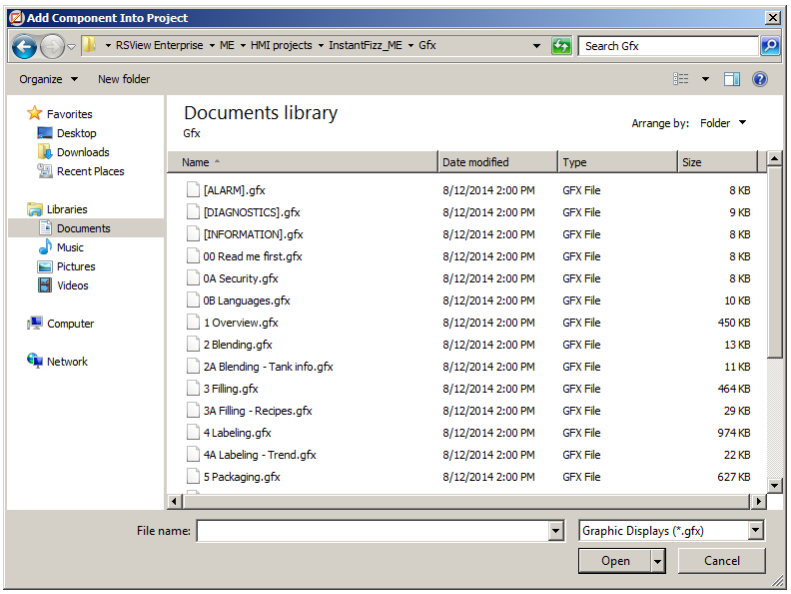
All the language strings associated with the component in Application A are copied into Application B. For example, if you add an information message file for which three sets of language strings have been defined, all three sets of strings are copied into Application B, regardless of which languages have been set up for Application B. For more information about using multiple languages, see Set up language switching on page 197.

To add a component from Application A into Application B

1. In Application B, right-click the type of editor that was used to create the desired component.

   For example, to add a graphic display component, right-click the Displays icon in the Graphics folder.

2. Click **Add Component Into Application**.


Add Component Into Project
RSView Enterprise ▸ ME ▸ HMI projects ▸ InstantFizz_ME ▸ Gfx
Search Gfx
Organize
New folder
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Computer
Network
Documents library
Gfx
Arrange by: Folder
Name
Date modified
Type
Size
[ALARM].gfx 8/12/2014 2:00 PM GFX File 8 KB
[DIAGNOSTICS].gfx 8/12/2014 2:00 PM GFX File 9 KB
[INFORMATION].gfx 8/12/2014 2:00 PM GFX File 8 KB
00 Read me first.gfx 8/12/2014 2:00 PM GFX File 8 KB
0A Security.gfx 8/12/2014 2:00 PM GFX File 8 KB
0B Languages.gfx 8/12/2014 2:00 PM GFX File 10 KB
1 Overview.gfx 8/12/2014 2:00 PM GFX File 450 KB
2 Blending.gfx 8/12/2014 2:00 PM GFX File 13 KB
2A Blending - Tank info.gfx 8/12/2014 2:00 PM GFX File 11 KB
3 Filling.gfx 8/12/2014 2:00 PM GFX File 464 KB
3A Filling - Recipes.gfx 8/12/2014 2:00 PM GFX File 29 KB
4 Labeling.gfx 8/12/2014 2:00 PM GFX File 974 KB
4A Labeling - Trend.gfx 8/12/2014 2:00 PM GFX File 22 KB
5 Packaging.gfx 8/12/2014 2:00 PM GFX File 627 KB
File name:
Graphic Displays (*.gfx)
Open
Cancel

3. In the dialog box, navigate to the component to add (in Application A's folder), and then click the component's file name.

   Click and Shift-click to select a group of components, or Ctrl-click to select multiple individual components.

   For information about application folders and files, see Work with applications on page 61.

4. Click **Open**. The components are listed under the editor in the Explorer window in Convert PanelBuilder and PanelBuilder32 applications on page 581.

If you later modify the component in Convert PanelBuilder 1400e applications on page 565, you can add the component into Convert PanelBuilder and PanelBuilder32 applications on page 581 again using the same steps as described above.

Use Add Component Into Application with graphic displays, graphic libraries, and global object displays

The **Add Component Into Application menu** command is also useful for:

- adding graphic displays to your application's Libraries folder
- using libraries as graphic displays in your application
- moving libraries into the Displays folder so you can export their strings for translation
- creating global object displays

For information about graphic libraries, see Use graphic libraries on page 313.

For information about global object displays, see Create global object displays and base objects on page 510.

Delete components

Deleting a component deletes it from the **Explorer** window and from the hard disk.

To delete a component

- Right-click the component, and then select **Delete**.

Remove components

You can remove a component from the **Explorer** window but leave it on the hard disk, in case you want to use the component in another application.

To remove a component

Right-click the component, and then select **Remove**.

Rename components

To rename a component

1. Right-click the component, and then click **Rename**.

2. In the **To** box, type the new name.
3. Click **OK**.

Duplicate components

The **Duplicate** option is useful for creating multiple similar components. For example, you could create a graphic display to use as a template, then duplicate the display each time you want to use the template.

To duplicate a component

1. Right-click the component, and then click **Duplicate**.
2. In the **Component** name box, type a name for the duplicate component.
3. Click **OK**.

Print components

For information about selecting a printer and printing components, see Print *on* page 51.

Use graphic displays

This chapter describes the **Graphics**, **Images**, and **Local Messages** editors in the **Graphics** folder and outlines how to:

- Use the **Graphics** editor
- Set up graphic displays
- Create a background for your displays
- Use graphic libraries
- Import graphic images
- Create local messages in your displays
- Print graphic displays at run time

Before creating graphic displays, specify project settings. Project settings determine important aspects of your graphic display such as size and position. For more information, see About project settings on page 72.

For information about global object displays and the **Parameters** editor, see Use parameters and global objects on page 501.

About graphic displays and graphic objects

A graphic display represents the operator's view of plant activity. The display can show system or process data and provide operators with a way to write values to an external data source. The data source can be memory or a device such as a programmable controller or an OPC server.

Operators can print the display at run time to create a visual record of tag values, object states, or current messages.

The elements that make up a graphic display are called graphic objects. You can create objects in the **Graphics** editor, or copy them from a global object display, from a graphic library, or from another application.

For information about creating and copying graphic objects, see Use graphic objects on page 331.

You can use up to 1,000 tags per graphic display. This limit includes the tags contained in embedded variables.

PanelView Plus 7 Standard applications, and Compact Machine Edition applications (applications running on PanelView Plus 6 Compact, or PanelView Plus Compact terminals) have a limited number of displays.

Before you begin

Before you begin, plan your displays. Think about what information the operator needs to see, and the best way to provide the information. For example:

- Does the operator need to know the exact speed of a conveyor belt, or just whether the belt is moving, jammed, or stopped?
- Do different users need to have access to different types of information?
- Do you need to limit access to certain types of information?

Also consider the runtime environment and how the operator will use the application:

- Does the runtime computer have a touch screen, mouse, keyboard, or some combination of these?
- How will the operator navigate through the displays of the application?
- Will the application be available in multiple languages?

Review the chapters on planning, security, and navigation before you begin creating displays. Browse through the sample applications for design ideas. Map out a display hierarchy. Then create a graphic display to use as a template.

The time you spend planning your displays will make your application easy to use and will save you time in the long run.

For information about	See
Plan your displays and creating a template	Plan applications on page 53
Set up application security to control access to displays	Set up security on page 175
Set up display navigation and creating a display hierarchy	Set up display navigation on page 213
Set up how objects are used at run time	Set up graphic objects on page 389

Use the Graphics editor

The **Graphics** editor opens when you create or open a graphic display, global object display, or graphic library. Each display is stored in the Displays folder. You can open and work on multiple graphic displays at the same time.

Create and open graphic displays

To create a graphic display

1. In the Graphics folder, do one of the following:

   - Right-click **Displays** and then click **New**.
   - Click the New Display tool .
   - Drag and drop the Displays icon into the workspace.

2. From the **Edit** menu, select **Display Settings** to open the **Display Settings** dialog box and specify settings for the display.

   For more information, see Set up graphic displays on page 309.

3. Create the objects you want to put in the display.

   For information about creating graphic objects, see Use graphic objects on page 331.

4. From the **File** menu, select **Save**, or click the Save tool .

5. In the **Component name** box, type a name for the display, and then click **OK**.

   The display is added to the list in the Displays folder.

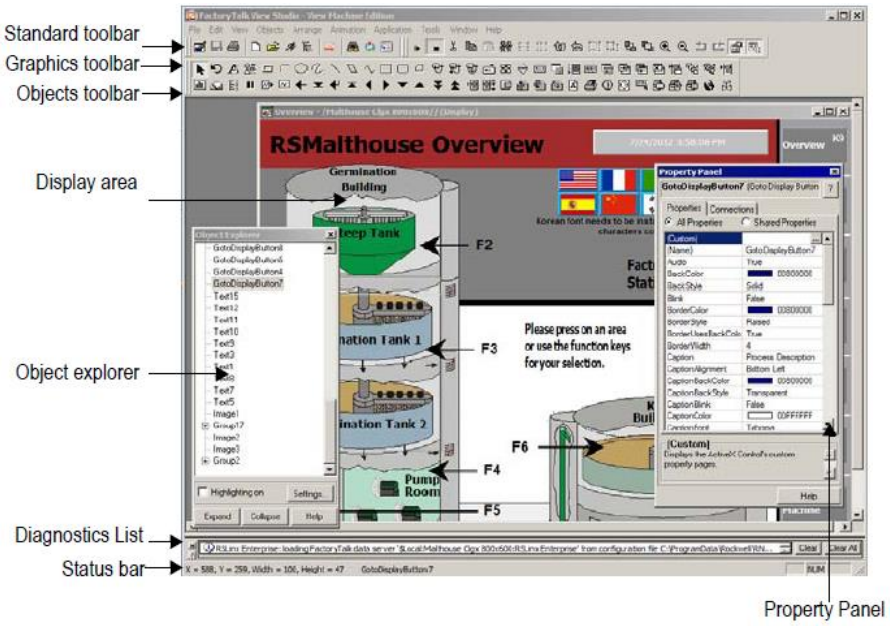
   The display is created as a Replace display by default, but you can change it to an On Top display in the **Display Settings** dialog box. For more information about display types, see About display types on page 310.

To open a graphic display

- In the **Graphics** folder, open the Displays folder and then double-click the display name, or right-click the display name and then click **Open**.

  You can also drag and drop the display from the **Explorer** window to an empty area in the FactoryTalk View Studio workspace.

This example shows a graphic display with the **Explorer** window closed.



The **Graphics** editor has special items on the **View** and **Edit** menus, and extra toolbars.

For details about using the **Graphics** editor, see Help.

Import and export graphic displays

Each graphic display's information is contained in a file called *Displayname*.gfx.

The Graphics Import Export Wizard in FactoryTalk View Studio allows you to export this information to an XML file, or to import a graphic display XML file.

You can export the display information, import the graphic display XML file to another FactoryTalk View application, and then modify it to suit your requirements. Or, you can modify the file before importing it.

You can use the Graphics Import Export Wizard to import graphic display information that has been created using an external programming tool or editor, or you can import a FactoryTalk View XML file.

For more information about importing and exporting graphic display files, see Import and export graphics XML files on page 613.

Tools and tips for working in the Graphics editor

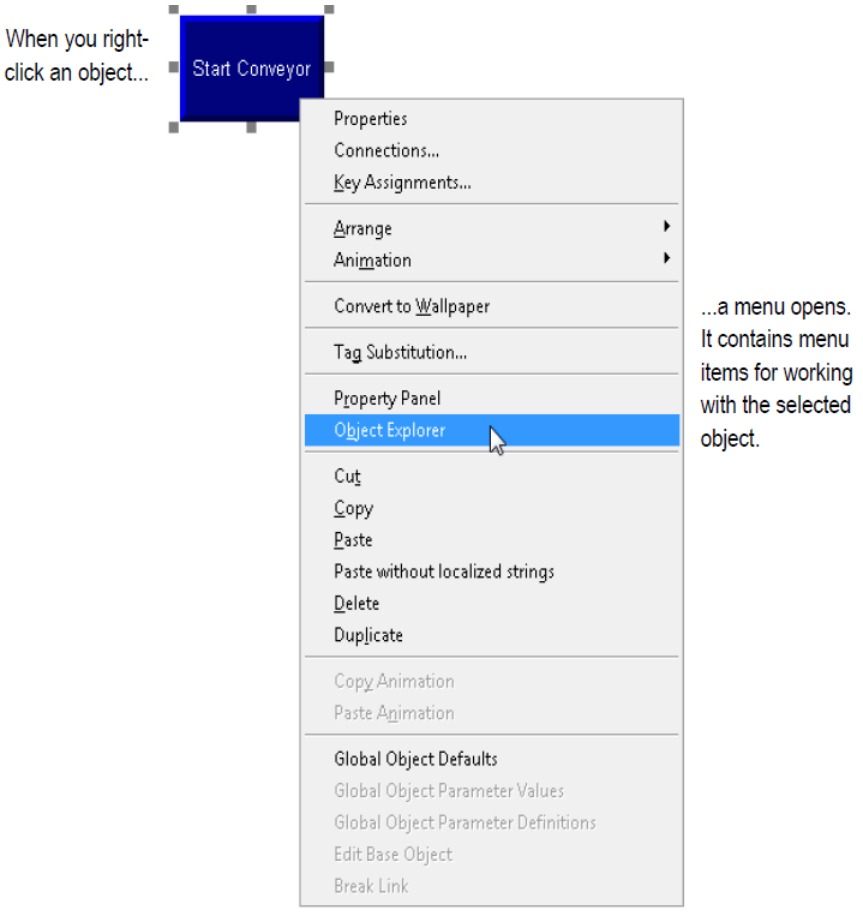
This section describes features of the **Graphics** editor that help you create your displays. It describes how to:

- Use context menus and toolbars to perform actions quickly.
- View displays in grayscale to emulate the appearance of a PanelView Plus terminal.
- Set up a grid that you can use to position and size objects precisely.
- Zoom in when you need to look at details closely.
- Correct mistakes.
- Test your displays as you work.

Use context menus

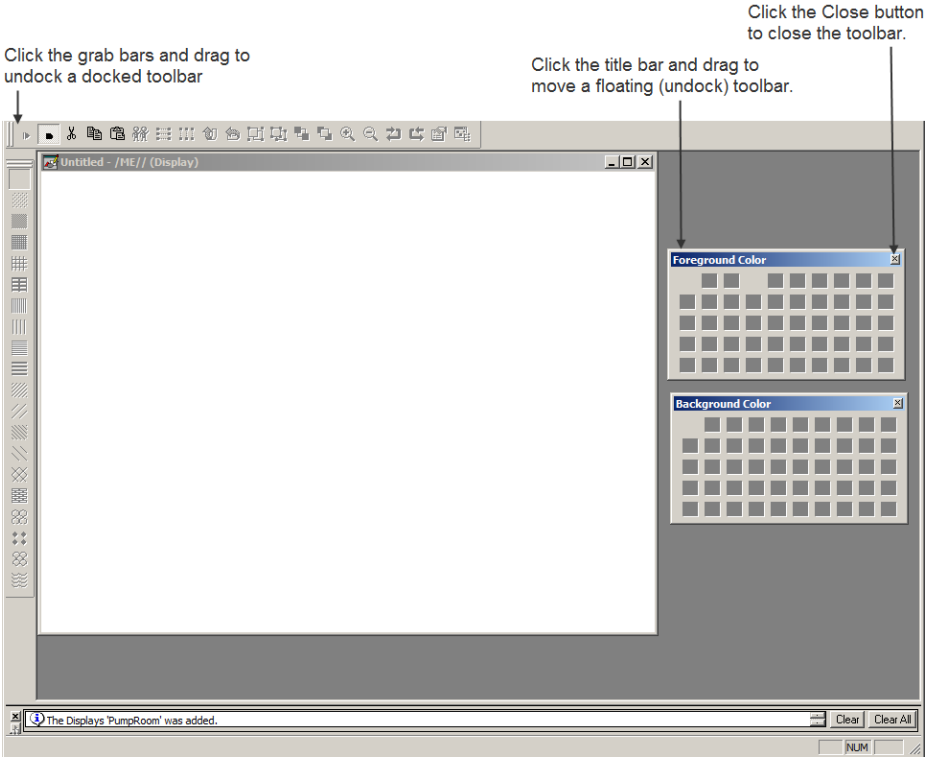
No matter where you are in the **Graphics** editor, you can open a menu by clicking the right mouse button. This is often quicker than moving the mouse up to the menus at the top of the screen.

The items on the menu depend on the cursor's location. For example, when you right-click an object, the menu contains the most common actions you can perform on that object.



Use the toolbars

The toolbars provide another convenient way to perform an action quickly. You can customize your workspace by dragging the toolbars to any location on the screen. You can also dock them to the inside edges of the FactoryTalk View Studio workspace.


Click the Close button to close the toolbar.
Click the grab bars and drag to undock a docked toolbar
Click the title bar and drag to move a floating (undock) toolbar.
Untitled - /ME// (Display)
Foreground Color
Background Color
The Displays 'PumpRoom' was added.
Clear
Clear All
NUM

To show a toolbar

- From the **View** menu, select **Toolbars**, and then click the toolbar to show.

  The menu shows a check mark beside the toolbars that are already open.

To undock a toolbar

- Click the double *grab bars* at the left or top of the toolbar, and then drag. Press the **Ctrl** key to prevent accidental re-docking.

To move an undocked toolbar

- Click the toolbar's title bar, and then drag. Press the **Ctrl** key to prevent accidental re-docking.

To dock a toolbar

- Click the toolbar's title bar, and then drag to any edge of the workspace.

To close a toolbar

- From the **View** menu, select **Toolbars**, and then click the name of the toolbar to close, or click the toolbar's **Close** button.

Show displays in grayscale

You can set displays to appear in grayscale, especially for developing applications that will run on the PanelView Plus grayscale terminals. When Show Displays in Grayscale is checked (on the View menu), all open displays will change from full color to grayscale. When Show Displays in Grayscale is cleared, all open displays will appear in color.

Show Displays in Grayscale does not work in Test Application mode.

Third party ActiveX objects will not appear in grayscale if Show Displays in Grayscale is checked.

Use the grid

To size and position objects precisely, use the grid. You can change the grid settings at any time during the drawing process.

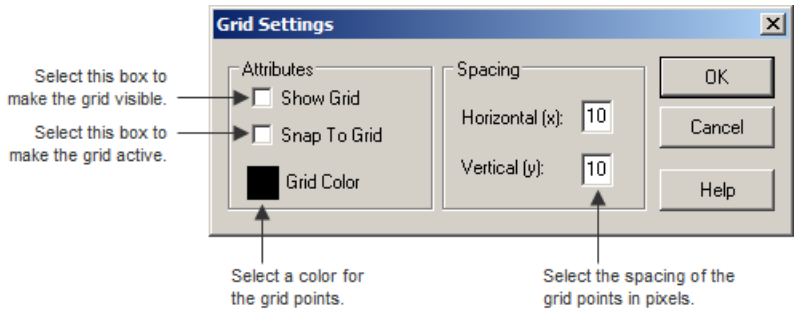
The grid can be active or passive. When the grid is active, all the objects you draw or position are pulled to the closest grid point. This makes it easy to align and size objects. When the grid is passive, it is visible but does not affect the position of your objects.

Make the grid passive to position an element between the grid lines. Make the grid active, and the next object you draw or place is automatically aligned with the grid. Making the grid active does not affect the placement of existing objects.

The grid is visible during application development only. It is not visible at run time.

To set up the grid

1. From the **View** menu, select **Grid Settings**, or right-click an empty area of the display and then click **Grid Settings**.



2. Specify the color and spacing of the grid points.
3. To turn on the grid, click **Show Grid.**

   When the **Grid Settings** dialog box is not open you can turn the grid on by clicking **Show Grid** on the View menu.

4. To make the grid active, click **Snap To Grid.**

   When the **Grid Settings** dialog box is not open you can make the grid active by clicking **Snap On** on the View menu.

5. Click **OK**.

To make the grid passive

- In the **Grid Settings** dialog box, clear the **Snap To Grid** check box, or from the **View** menu select **Snap On** to toggle the option off.

  There is no check mark beside the menu item when it is turned off.

To turn off the grid

- In the **Grid Settings** dialog box, clear the **Show Grid** check box, or from the **View** menu, select **Show Grid** to toggle the option off.

Zoom in and out

To magnify or reduce your view of a graphic display, use Zoom In and Zoom Out. Zoom In magnifies objects; Zoom Out reduces magnification.

To zoom in on objects

1. Select the objects you want to zoom in on.
2. From the **View** menu, select **Zoom In**, or click the Zoom In tool .

To zoom out

- From the **View** menu, select **Zoom Out**, or click the Zoom Out tool .

Correct mistakes

If you change your mind about something you did, you can undo the action. If you change your mind again, you can redo the action.

You can undo and redo all the operations you performed since you last saved the display, one operation at a time.

The operations you perform between opening and closing a dialog box are treated as a single operation. Operations you perform in the **Property Panel** are treated as separate operations.

To undo an operation

- From the **Edit** menu, click **Undo**, or click the Undo tool .

To redo an operation

- From the **Edit** menu, select **Redo**, or click the Redo tool .

Test your displays as you work

To test the objects in your displays as you work, use the Test Display tool to switch to test mode. When you are finished testing, switch back to edit mode to continue editing.

Note: Test mode is not the same as running the display. It does not change the appearance or position of the display as set up in the **Display Settings** dialog box. Alarm and information messages are not shown, although if communications are set up, tag values are read and written. Display navigation, data logging, and macros do not work in this mode. If you want to test these features, test the application as described on Test your application on page 221.

If you set up local messages and graphic objects to use multiple languages, the messages and objects are shown in the current application language during test mode.

Use the Diagnostics List when in test mode

The **Diagnostics List** shows messages about system activities when you test your graphic displays. You can specify the types of messages to show in the **Diagnostics List**, move the list, resize it, and clear the messages in it.

For information about using the **Diagnostics List**, see The Diagnostics List on page 43.

For information about specifying the types of messages to show in the **Diagnostics List**, see Show diagnostics messages during application development on page 165.

To use test mode

- From the **View** menu, select **Test Display**, or click the Test Display tool .

To return to edit mode

- From the **View** menu, select **Edit Display,** or click the Edit Display tool .

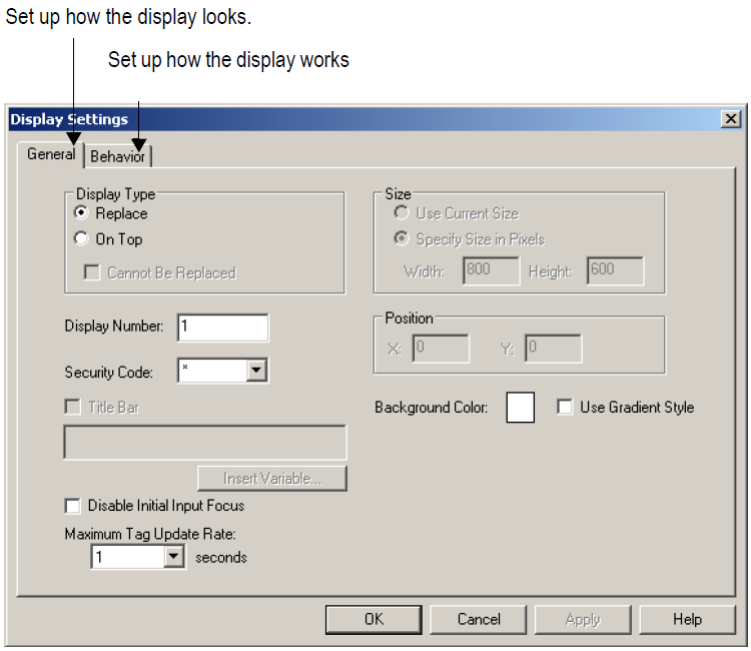
Set up graphic displays

To set up a graphic display, specify its type, background color, and runtime behavior in the **Display Settings** dialog box. You can specify and edit the display settings at any time while you work on your display.

Specify display settings

To specify display settings

- From the **Edit** menu, select **Display Settings**, or right-click an empty area of the display and then select **Display Settings**.



For details about the options in the **Display Settings** dialog box, see Help.

About display types

Replace displays

Replace is the default display type. Replace displays are full-sized displays. They use the project window size specified in the **Project Settings** editor.

For more information about the project window size, see Project window size and runtime screen resolution on page 72.

At run time, you can have only one Replace display open at a time. When the operator opens a Replace display, this is what happens:

- The Replace display that was open closes.
- On Top displays that do not use the **Cannot Be Replaced** option are closed.
- The new Replace display opens.

- On Top displays that use the **Cannot Be Replaced** option remain open, on top of the new Replace display.

If the operator attempts to open a Replace display that is already open (for example, using a **Goto display** button to which the same display is assigned), the display does not close and FactoryTalk View sends an error message to FactoryTalk Diagnostics.

On Top displays

Use the On Top option to create pop-up displays that open on top of the current Replace display. Usually, On Top displays are smaller than Replace displays, so the operator does not lose track of display navigation.

You can open multiple On Top displays. If more than one On Top display is open, the display that has focus, or had the most recent focus, appears on top.

When an On Top display closes, the display that had the most recent focus appears on top.

Use the Cannot Be Replaced option if you want the On Top display to remain open when a new Replace display is opened.

On Top displays do not have a Close button in the title bar. Be sure to create a close button graphic object in On Top displays so the operator can close them.

The operator cannot move an On Top display by dragging its title bar. The runtime position of the display is fixed (according to the position settings defined for the display).

You can specify unique titles for On Top displays. You can use embedded variables in the title, and the title text can switch languages at run time.

Resize displays

The project window size is used for all Replace displays. If you change the project window size after you have designed any graphic displays, you have the option of scaling graphic displays.

If you choose to scale graphic displays, all Replace and On Top displays are resized and the objects in them are scaled to fit the new size. You can also specify whether to scale the font size and border size of the graphic objects, and the size of graphic images in the Images folder.

If you choose not to scale displays when you change the project window size, Replace displays are resized, but any objects in the displays remain the same size and in the same position as before. On Top displays are not resized.

For information about specifying the project window size, see Project window size and runtime screen resolution on page 72.

Change the display area while working

You can change the display area of a display while you're working on it by dragging the border of the display area. For example, you might want to make the display area smaller so you can see parts of two displays in order to drag and drop objects between them.

Changing the display area in this manner does not change the display size for Replace displays. For On Top displays that are sized with the **Use Current Size** option, dragging the border does resize the display.

Another way to arrange multiple displays while working on them is to use the options on the Windows menu. For example, Tile Horizontal arranges all the open displays with as much of the top part of each display showing as possible.

Create a background for your display

You can create a background for your graphic display by converting graphic objects to wallpaper. When objects are converted to wallpaper, they are locked into position and become an unchanging background for the other objects in the display.

Convert objects that do not need to be animated or updated with tag values can significantly improve the runtime performance of a graphic display.

Objects that have been converted to wallpaper cannot be selected or edited until you unlock the wallpaper. Also, animations attached to the wallpaper objects are not in effect. However, animations are restored when you unlock the wallpaper.

Similarly, any tags or expressions assigned to an object become inactive when the object is converted to wallpaper. Connections are restored if you unlock the wallpaper.

To manage a number of objects easily, group the objects, and then convert the group to wallpaper.

To convert objects to wallpaper

1. Select the objects to convert.

   For information about selecting objects, see Select and deselect objects on page 355.

2. From the **Edit** menu, select **Wallpaper**, and then click **Convert to Wallpaper.**

4. For a single object, you can right-click it and then select **Convert to Wallpaper**.

To unlock the wallpaper

- From the **Edit** menu, select **Wallpaper**, and then click **Unlock All Wallpaper**.

  All objects in the graphic display are converted back to their original state.

Use graphic libraries

There are two graphic libraries that are available, Symbol Factory and Graphics Library

FactoryTalk View Studio Graphics Library comes with a set of libraries, contained in the Libraries folder. As with a public library, the graphics libraries can provide you with source materials and reference information.

Each graphic library consists of a graphic display, with the file extension .gfx. The library displays contain graphic objects that you might find useful in your own application. Many of the objects are preconfigured with animation. For example, see the Conveyor parts library.

You can:

- Look at the objects and displays to get ideas for your own application.
- Drag and drop (or copy and paste) objects from the libraries into your own displays.

  For information about copying objects from a library into your graphic display, see Copy objects on page 372.
- Use the objects as they are or change them to suit your needs.
- Create your own libraries of objects.
- Create libraries of displays that are translated into multiple languages.
- Use libraries as displays in your application.

Work with Symbol Factory

The Symbol Factory is a library of over 5,000 graphics for industrial automation, including pumps, pipes, valves, tanks, mixers, motors, ducts, electrical symbols, flow meters, material handling, sensors, PLCs, transmitters, and ISA symbols.

To open Symbol Factory

Symbol Factory opens into a new window when launched, there are four ways to open Symbol Factory:

- From the **Explorer**, click on the Symbol Factory Object.
- When the **Objects menu** is available, click on the Symbol Factory drop down menu item.
- When the **Objects toolbar** is available, click on the Symbol Factory icon .
- Clicking the **Launch Symbol Factory** button in the **Image Browser**.

To select a graphic:

1. Browse the **Categories** frame, clicking a category to see the symbols in the right frame.
2. Click the graphic to select it for the Graphic Display.

If the graphic is to be used in this original state, it can be dragged and dropped into the Graphic Display.

Note: When View Studio is unlicensed and in Grace Period mode, the Symbol Factory library will be in demo mode and restricted in the number and type of graphics available for use. Only a licensed View Studio can enable a fully licensed Symbol Factory library.

Manipulate the graphic:

With the graphic selected, it can be modified using Symbol Factory

1. Select **Options** on the menu.
2. Select **Symbol Options** from the drop down menu.
3. The **Symbol Options** dialog box allows the graphic to be modified in several ways. The orientation can be changed, it can be rotated, the fill color can be changed and applied to the graphic in different modes.
4. The Preview frame will show the changes made to the graphic.
5. When finished modifying, the graphic can be dragged and dropped from the Preview frame to the Graphic Display, or copied and pasted into the Graphic Display.

Symbol Factory has its own Help file which explains operations within Symbol Factory and its functions.

For more information, click **Help** in the Symbol Factory

To open a graphic library

1. In the **Explorer** window, open the **Graphics** folder, and then open the **Libraries** folder.
2. Double-click the library name, or right-click it and then select **Open**.

Create graphic libraries

You can create a graphic library in the **Libraries** folder, or create a graphic display in the Displays folder and then add the display to the Libraries folder.

To create a graphic library

1. In the Graphics folder, right-click Libraries and then click **New**.
2. Create the objects you want to put in the library.

   For information about creating graphic objects, see Use graphic objects on page 331.

3. From the **File** menu select **Save**, or click the Save tool .
4. In the Component name box, type a name for the library, and then click **OK**.

   The library is added to the list in the Libraries folder.

You can also create a graphic display and then use Add Component Into Application to add the display to the Libraries folder.

To add a graphic display to the library

1. Create the graphic display.
2. In the **Explorer** window, in the **Graphics** folder, right-click the **Libraries** icon.
3. Click **Add Component Into Application**.
4. In the dialog box, navigate to the Gfx folder, and then click the .gfx file for the display to use.

   The Gfx folder is located in:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects***Application Name*
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects***Application Name*

where *Application Name* is the name of your application.

5. Click **Open**. The display is copied into the Libraries folder.

Use libraries as displays in your application

The graphic libraries are available on the development computer, but do not appear at run time. To use a library as a graphic display at run time, you must add the library into your application's folder of graphic displays.

If the library does not contain strings for languages supported by the current application, the undefined strings are shown with question marks (?).

To use a library as a display in your application

1. In the **Explorer** window, in the **Graphics** folder, right-click the **Displays** icon.
2. Click **Add Component Into Application**.
3. In the dialog box, navigate to the **Libraries** folder, and then click the .gfx file for the library to use.

   The **Libraries** folder is located in:

   - (Windows XP) **\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME**
   - (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **\Users\Public\Public Documents\RSView Enterprise\ME**

4. Click **Open**. The library is copied into the **Displays** folder.

Use libraries to store displays with multiple languages

The maximum number of languages an application can use is 40 during development, and 20 at run time. Since the libraries are stored outside of the HMI project folder and are available to all applications, they do not have this

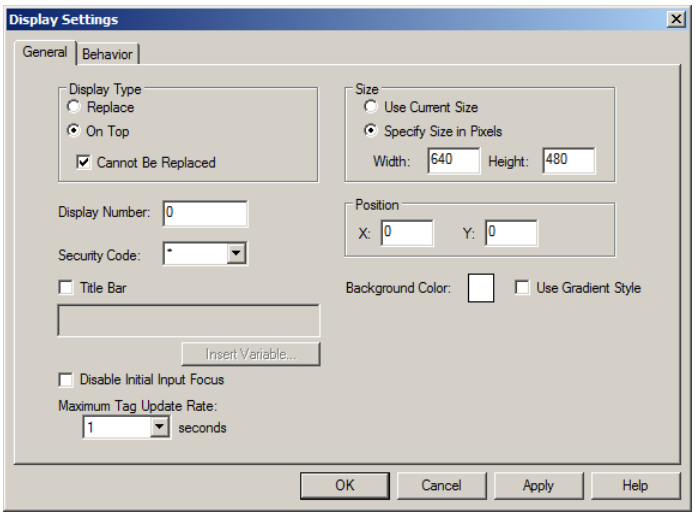
limit. However, since they are not stored in the HMI project folder, you cannot export the strings in library displays for translation. Instead, export a graphic display for translation, import the translated strings, then add the display into the library.

When you use a library display in your application, make sure you add to your application the languages that you plan to use from the library.

To save a library display with multiple languages

1. Create a graphic display.
2. Export the text for your application, which will include the text used in the graphic display.
3. Translate the text strings into each desired language, saving the file with a new name for each language.
4. Import the files for all the new languages.
5. Add the graphic display to the Libraries folder.

   The library is created with the option Support Multiple Languages selected (in the **Display Settings** dialog box).



For detailed information about importing and exporting to use multiple languages, see Set up language switching on page 197.

To save a library display with more than 40 languages

1. Create a display in one application, with up to 40 languages, and add it to the library, as described in the previous section.

2. Add the display into a new application, with up to 40 different languages in the new application.

3. Export the text for your application, which will include the text used in the graphic display.

4. Translate the text strings into each desired language, saving the file with a new name for each language.

5. Import the files for the new languages.

6. Add the graphic display (with the same name as the display in step 1) to the Libraries folder.

   The new languages are added to the library. Make sure the display contains the same objects as the original display. Otherwise the new display will overwrite the previous display, and all the original language strings will be undefined.

What is shown

When you open a library that supports multiple languages, the strings are shown using the current application language, if available. If the library does not contain the current language, the strings are shown as single question marks. Similarly, if the library contains the language but not all the strings are defined for the language, undefined strings are shown as single question marks.

For more information about using multiple languages with graphic libraries, see Set up language switching on page 197.

Location of library components

The Libraries folder is located in:

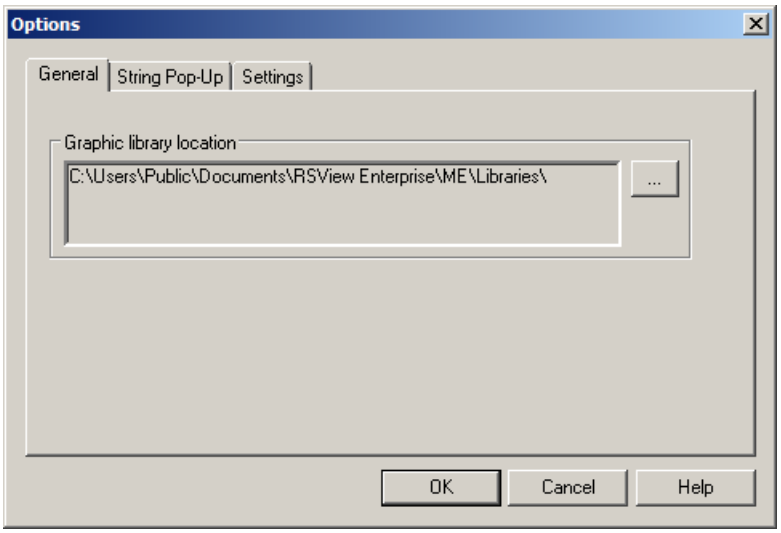
- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\ME**

If desired, you can specify a different directory in which to store library components. If you specify a different directory, FactoryTalk View saves graphic libraries that you add or create in the new directory. Similarly, when you open a library component FactoryTalk View looks for the component in the specified directory.

If you specify a different directory but want to use the libraries that come with FactoryTalk View, use My Computer or Windows Explorer to copy the library component files into the directory you have specified, or else change the path back to the default path when you want to open a FactoryTalk View library component.

To specify a new path for graphic libraries

- From the **Tools** menu, select **Options**.



For details about using the **Options** dialog box, see Help.

Import images into your application

You can use these types of external graphic files in your graphic displays:

- .bmp — bitmap images
- .jpg — JPEG images
- .png — PNG images
- .dxf — AutoCAD files
- .wmf — Windows metafiles

You import and place .dxf and .wmf files in your displays in one step. Once imported, they are converted to drawing objects. For more information about using these types of files in your displays, see Use .wmf and .dxf files on page 352.

Bitmap images that come with FactoryTalk View Studio

FactoryTalk View Studio comes with sets of bitmaps that are useful for illustrating graphic objects and displays:

- Arrows
- DIN symbols
- ISA symbols
- Keyboard button symbols such as Enter and Page Up
- Parts such as buttons, conveyors, pipes, tanks, and valves

The symbols and most of the arrows are monochrome (that is, use only two colors, one for the line and one for the fill).

You can set up the line and fill colors for the monochrome images that you use for your objects.

For color images, including JPEG images, you can specify whether to use a gradient, transparent, or solid background fill. If you select the transparent background fill style, the black portions of the image become transparent.

For detailed information about setting up objects, see Help.

Location of bitmap files

The bitmap files that come with FactoryTalk View Studio are stored in this directory:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\Images**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\Images**

The images are in folders called Arrows, DIN, ISA, ListKey, and Parts.

Import bitmap, PNG, and JPEG images

To use bitmap, PNG, and JPEG images, you can:

- Import the images first, and then place them in your displays as needed. This method is useful for images that you use to illustrate your displays.

  For information about placing images in your display once you have imported them, see To place a bitmap, PNG, or JPEG image in a display on page 345.

- Use the **Image Browser** to import images as needed while setting up your graphic objects. This method is useful for images that you use as labels on your graphic objects.

For information about using the **Image Browser**, see Use the Image Browser to import images on page 322.

- Copy and paste images from the graphic libraries.

  For information about copying and pasting objects, see Copy objects on page 372.

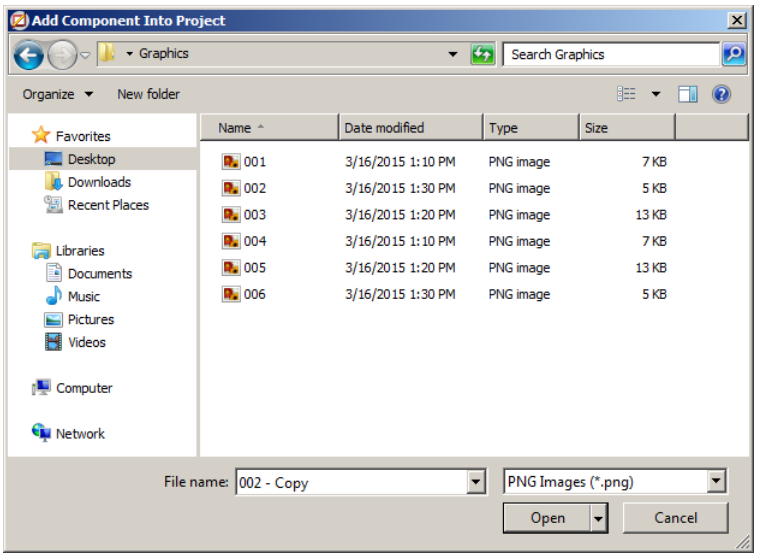
- Copy and paste images from one application to another.

  For information about opening two applications at once, see Open multiple applications on page 70.

If you will be using images that have more than 256 colors, before importing the images set up your video adapter to show more than 256 colors. This will ensure that the colors of imported images appear the same as in the original. For more tips about using images, see Tips for using images on page 324.

To import bitmap, PNG, and JPEG images

1. In the **Graphics** folder, right-click **Images** and then select **Add Component Into Application.**



2. In the **Files of type** box, select the type of image to add.

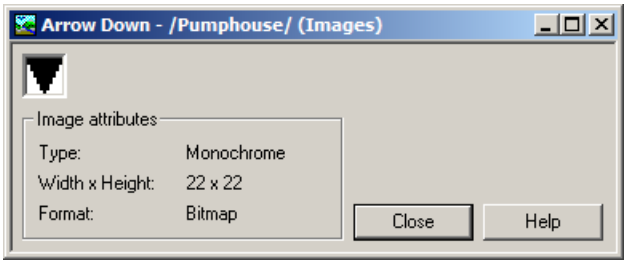
3. Navigate to the directory where the .bmp, .png, or .jpg file is stored, and then click the file name.

   Shift-click or Ctrl-click to select additional files.

4. Click **Open** to add the selected files to the list in the **Images** folder.

To view an image that you have imported

- In the Images folder, double-click the image name, or right-click it and then click **Open**.



Use the Image Browser to import images

Use the **Image Browser** to import images as needed while you set up graphic objects.

In the **Image Browser** you can:

- Import images into the application
- Select the image to use on a graphic object
- Delete images from the application

To open the Image Browser, use one of these methods

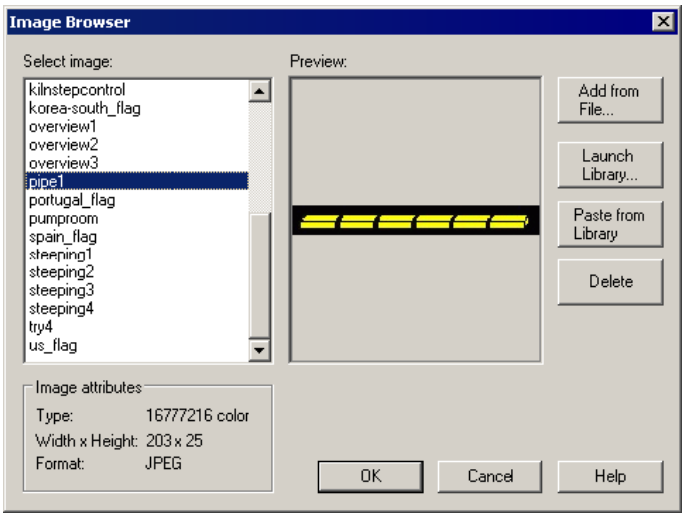
- In an object's **Properties** dialog box, click the **Browse** button ... next to the **Image** box.

  Depending on the type of object, the **Image** box could be located on the **General** tab, **Label** tab, or **States** tab.

  For information about opening the **Properties** dialog box, see To open an object's Properties dialog box, use one of these methods on page 359.

- With one or more objects selected, in the **Property Panel**, click the **Image** property, and then click the **Browse** button.

For information about opening the **Property Panel**, see Use the Property Panel on page 360.



For details about using the **Image Browser** to import, select, and delete images, see Help.

You can also remove an image by right-clicking it in the Images folder, and then select **Remove** or **Delete**. For more information, see Remove components on page 297.

Use Symbol Factory

Symbol Factory is a third-party graphics library that provides a large number of quality graphic elements.

Import Symbol Factory objects directly into image container

1. From the **Image Browser** window, click the **Launch Library…** button. This will open a **Symbol Factory** window.

2. Browse through the **Categories** and locate the graphic to be used. Select the graphic so it is highlighted. Click the **Copy** button in Symbol Factory. Symbol Factory will be minimized to the system tray.

3. From the **Image Browser**, click the **Paste from Library** button.

4. A dialog box will open and ask for a unique image name. Type the new name over the default text *SFBitmap1*.

5. Click the **OK** button in the **Image name** dialog box. The dialog box will close returning you to the **Image Browser**. The new image will be shown and the new image name shown in the image browser explorer.

6. Click the **OK** button in the **Image Browser** for the graphic to be placed in the current workspace.

Note that any Symbol Factory object, including Bitmap, DIB and metafile can be pasted into **Image Browser** where it will be stored as a bitmap.

Import Symbol Factory objects directly into display

1. Launch Symbol Factory either by using the **Menu** bar (**Objects > Symbol Factory**), or from the **Objects** toolbar ( ).

2. Browse through the **Categories** and locate the graphic to be used. Select the graphic so it is highlighted. To place the object into the display you could do one of the following:

   - Click the **Copy** button in Symbol Factory. Symbol Factory will be minimized to the system tray, then from the **Menu** bar, click **Edit** and paste.
   - Click the object and hold down the mouse button while dragging the object to where you want it placed on the display. Releasing the mouse drops the object onto the display.

Tips for using images

Use bitmaps versus JPEG images

When deciding whether to use a bitmap image or a JPEG image, consider these points:

- FactoryTalk View supports 256 color (grayscale) and 16 million color JPEG images only. For all other color types, use bitmaps.
- For large color images (16 million color, 320 x 240 pixels or larger), JPEG images load faster than bitmaps. In all other cases, bitmaps load faster than JPEGs.
- Color JPEG images have a much smaller file size than the equivalent bitmap image, and therefore require less disk space at run time.

Guidelines for using images

Images consume Windows resources, so when using graphic images use the lowest color depth possible.

The more colors you use, the more memory is consumed, and the longer the image takes to load and show.

This bitmap type	Consumes this many bits per pixel
Monochrome	1
16 color	4
256 color	8 (1 byte)
64 K color	16 (2 bytes)
16 million color	24 (3 bytes)

For example, a 24-bit bitmap image that measures 800x600 pixels consumes 1440 KB of memory. If the bitmap color depth is decreased to 256 colors, the image might have minor color loss, but the new image uses only 480 KB of memory.

Use images with a similar pixel size to the size of the FactoryTalk View object on which the image will be placed. FactoryTalk View resizes the image to fit the object, but if you use an image that is much larger than the object, the display will be slow to open at run time, due to the time required to resize the image.

Use local messages

Use local messages to give the operator ongoing information about the status of devices and processes. For example, you might use local messages to describe the status of a device whose condition cannot be shown graphically with complete accuracy.

The messages you create in the **Local Messages** editor are shown in local message display objects in graphic displays. You can use multiple local message display objects in your application, and link each object to a different file of messages. Or, you can use the same file of messages for multiple local message display objects.

Local messages versus information messages

Use local messages to give the operator information in a specific graphic display while the display is open. To give the operator information no matter which display is open, use information messages.

For details about information messages, see Use information messages on page 525.

Steps for setting up local messages

Follow these steps to set up local messages:

1. In the **Local Messages** editor, set up the messages and their trigger values.

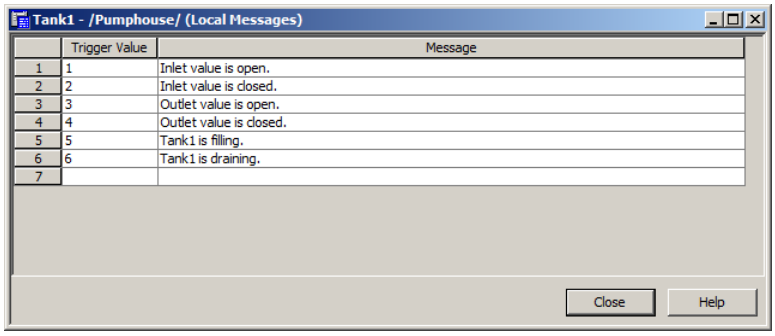
2. In the **Graphics** editor, create local message display objects in the graphic displays in which you want the messages to appear at run time. For each local message display, assign a tag or expression to the **Value** connection and specify the file of messages to show.

   For information about creating graphic objects, see Use graphic objects on page 331.

   For information about setting up local message display objects, see Set up local message displays on page 443.

Use the Local Messages editor

Use the **Local Messages** editor to create one or more files of local messages. Each file is stored in the editor's folder. You can open and work on multiple message files at the same time.



You can define up to 10,000 messages in each message file.

For details about using the **Local Messages** editor, see Help.

Prepare to set up local messages

As your application is running, information is continually sent to the data source about the state of various processes. For example, your application might be monitoring whether a valve is open or closed, or the temperature in a boiler. Values representing the status of these processes are sent to the data source.

The data source

The FactoryTalk View documentation uses the term data source as a generic term that includes all possible sources of tag data, for both data server tags and HMI tags. The data source can be memory or a device such as a programmable controller or OPC server. FactoryTalk View writes values to and reads values from the data source.

The data source is set up to exchange information (in the form of numeric or string values) between FactoryTalk View and the machine that your application is controlling.

Identify the tags and values to monitor

To set up local messages, determine which tags associated with machine processes to monitor, and identify the values for those tags that will trigger local messages.

For information about creating HMI tags, see Use HMI tags on page 97.

How local messages work

These are the key parts of the local message system:

- **Local message files** — text files containing lists of messages, with a numeric trigger value for each message
- **Local message display object** —a graphic object that shows local messages when the **Value connection** assigned to the object matches a message's trigger value
- **Value connection** — a tag or expression. When the value of this connection matches a message's trigger value, the local message display object shows the associated message.

The local message display object always appears in the graphic display it's placed in, whether or not there is a message to show. However, the operator does not see the message unless the object is located in the display the operator is currently viewing.

Example: Show local messages

This example shows how to notify the operator of the status of a hoist. In the example, the key parts of the local message system work together.

1. Create a tag called *Hoist_Status*. This tag points to an address in a programmable controller that is linked to sensors on the hoist. The tag has five possible values:

The tag has this value	When the hoist has this status
1	At bottom
2	Raising
3	Stopped between the top and bottom
4	Lowering
5	At top

2. In the **Local Messages** editor, create these messages with trigger values matching the values that will be sent to the **Hoist_Status** tag:

Trigger value	Message
1	The hoist is ready to rise
2	The hoist is raising the pallet.
3	The hoist has stopped.
4	The hoist is lowering the pallet.
5	The hoist is finished rising.

   Save the message file with the name *Hoist status*.

3. In the **Graphics** editor, create a local message display object. In the object's **Properties** dialog box, assign the **Hoist_Status** tag to the **Value** connection, and select the Hoist status message file.

At run time, when the operator views the graphic display containing the local message display object, the status of the hoist is shown.

Local messages and trigger values

Create messages associated with each tag value that you want to inform the operator about. Assign each message a trigger value, and set up the data source to send the trigger value to the **Value** connection. You can use both HMI and data server tags

The trigger value can be any non-zero integer value (positive or negative). Trigger values do not need to be contiguous, but they must be unique for each message. For example, you could use trigger values of 1, 2, and 3, or values of 10, 20, and 30.

If you use an analog tag or an expression, you can use any non-zero integer or floating point value to trigger an alarm. Floating point values are rounded to the nearest integer. For information about how values are rounded, see How values are rounded on page 98.

Trigger values cannot be 0. Digital tags have two possible values, 0 and 1. Therefore, if you use a digital tag you can only use the value 1 to trigger a message. If you want to use a digital tag to trigger two different messages, create an expression that adds 1 to the digital tag's value. That way, you can use the trigger values 1 and 2.

When the **Value** connection value is 0, the local message display object is cleared.

Create local messages in multiple languages

FactoryTalk View 5.00 supports local messages in multiple languages. When you create local messages, they are in the current application language. You can export the local messages for translation and then import them back into the application. For details, see Set up language switching on page 197.

Language switching local messages in FactoryTalk View ME Station 4.00

For applications that will run in FactoryTalk View ME Station version 4.00, use the CurrentLanguage( ) expression function to specify message offsets in the local message file. In the file, divide your messages into sections for each language. For information about the CurrentLanguage( ) function, see Language function on page 487.

How the local message display graphic object works

When you open a graphic display at run time, FactoryTalk View reads the value of the **Value** connection and updates the local message display object based on the value.

What is shown

- If the **Value connection** is unassigned, the display is filled with question marks (?).
- The **Value connection** is rounded to the nearest integer. If the value does not match any of the trigger values in the specified message file, the display is filled with question marks.

  For information about how values are rounded, see How values are rounded on page 98.
- If the message is too long to fit in the object, the last shown character is replaced with an asterisk (*).
- When the **Value connection**'s value is 0, the display is cleared.
- If you set up local messages in multiple languages, messages are shown in the current application language. When a language switch occurs, the message that was already in the local message display remains in the language that it originally appeared in. New messages are shown in the new language.

Print displays

You can print your graphic displays on the development computer. This might be useful if you want other people to review the displays before implementing the application, or if you want to keep a visual record of the displays.

You can also print graphic displays at run time, to provide a printed record of process values such as trend data.

For information about printing on the development computer, see Print on page 51.

Print displays at run time

When you print a display at run time, everything on the screen is printed, including the current display, pop-up windows, and any visible background applications.

For information about specifying which printer to use at run time for applications that will run on a personal computer, see Specify the printers to use at run time on page 238.

For information about specifying printer options for applications that will run on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, see the *PanelView Plus Terminals User Manual*.

To print graphic displays at run time

Use one or both of these methods:

- Create display print buttons in the graphic displays you want to print. At run time, the operator presses the buttons to print the displays.

  For information about creating graphic objects, see Use graphic objects on page 331.

- Assign a tag or expression to the **Remote Display Print** connection (in the **Global Connections** editor). When the value of the tag or expression changes from 0 to a non-zero value, the current displays are automatically printed.

  Program the data source to trigger the change as often as you want the data printed.

  For more information about setting up remote display printing, see Print displays on page 329.

Use graphic objects

This chapter describes the types of graphic objects and outlines how to:

- Create graphic objects, including drawing and ActiveX objects
- Select and deselect objects and use the Object Explorer
- Use the **Properties** dialog box and **Property Panel** to set up objects
- Color and name objects
- Test how objects look in different states
- Assign tags and expressions to objects
- Replace tags using tag substitution
- Use tag placeholders
- Move, copy, duplicate, resize, reshape, and delete objects
- Group and ungroup objects, and edit group objects
- Arrange objects and lock objects into position

For information about setting up graphic objects once you have created them, see Set up graphic objects on page 389.

For information about setting up global objects, see Use parameters and global objects on page 501.

For examples of how to set up objects, see the sample applications that come with RSLinx Classic Studio. The Help also provides examples of how to use objects.

Types of graphic objects

The elements that make up a graphic display are called graphic objects. Use objects to control your process, machines, and application.

FactoryTalk View comes with a complete range of configurable objects such as push buttons, list selectors, bar graphs, and trends. Some objects interact with the data source, allowing the operator to change or view tag values. For example, the operator can push a button to set a tag value to 1, causing a programmable controller to start a conveyor belt. Other objects are used to control your application. For example, there are button objects that you can use to change displays and scroll through lists.

FactoryTalk View also comes with drawing objects that you can use to illustrate your graphic displays. The drawing objects include text, bitmap images, and geometric and freehand shapes.

FactoryTalk View also supports the use of ActiveX objects — third-party software components that you can use to control processes and display information. The ActiveX objects available depend on which third-party applications are installed on your development computer. For example, products such as Microsoft Visual Basic, Rockwell Automation, and Microsoft Office provide ActiveX objects that are configurable in FactoryTalk View Studio.

Use the tables

The tables beginning on the next page will help you choose which objects to use to control your application, machines, and process. The tables group the objects according to function, provide an overview of what each object does, and list cross-references to more detailed information about using the objects.

About connections

Many of the objects use connections to interact with the data source. A connection is the link between the object and the data source. Depending on an object's function, the object may have more than one connection. For example, a Momentary push button has a **Value connection** and an **Indicator** connection. The **Value connection** is used to set a value at the data source, and the **Indicator** connection is used to show the data source value in your graphic display.

By assigning tags or expressions to an object's connections, you control the flow of data between the application and the data source, which in turn controls your process or machines. Assign tags or expressions to an object's connections in the **Connections** tab of the object's **Properties** dialog box (see Use the Properties dialog box on page 358), or in the **Connections** tab of the **Property Panel** (see Use the Property Panel on page 360).

Use graphic objects

Illustrate your displays

Use this graphic object	To do this
Text	Create text for labels or instructions in the display. See Create text on page 343.
Image	Place images in your display. For more information, see Create images on page 345.
Panel	Draw rectangles that have borders. See Create panels on page 347.

Use this graphic object	To do this
Arc	Draw an arc (a segment of an ellipse or circle's perimeter). See Create arcs and wedges on page 347.
Ellipse	Draw ellipses and circles. See Create ellipses and circles on page 348.
Freehand	Draw freehand shapes as you would with a pen on paper. See Create freehand shapes on page 349.
Line	Draw straight diagonal, horizontal, and vertical lines. See Create lines on page 349.
Polygon	Draw a series of connected straight lines forming a closed shape. See Create polygons and polylines on page 350.
Polyline	Draw a series of connected straight lines. See Create polygons and polylines on page 350.
Rectangle	Draw rectangles and squares. See Create rectangles and squares on page 351.
Rounded rectangle	Draw rectangles and squares with rounded corners. See Create rounded rectangles and squares on page 351.
Wedge	Draw a filled segment of an ellipse or circle. See Create arcs and wedges on page 347.
Symbol Factory	Select images to place in your display.

Control the application

Use this graphic object	To do this
Goto display button	Open a graphic display. For details, see Goto display buttons on page 216.
Return to display button	Close a display and return to the previous display. For details, see Return to display buttons on page 217.
Close display button	Close a display. Can also send a value to a tag. For details, see Close display buttons on page 218.
Display list selector	Select a display to open from a list of displays. For details, see Display list selectors on page 218.
Display print button	Print the current display. For details, see To print graphic displays at run time, use one or both of these methods on page 330.
Language Switch button	Switch the application language. For details, see About language switching on page 197.
Login button	Open the **Login** dialog box and then log in. For details, see Provide a way for users to log in and log out on page 186.

Use this graphic object	To do this
Logout button	Log out of the application. For details, see Log out on page 186.
Password button	Change the current user's password, or any user password. For details, see Change passwords on page 267.
Add User/Group button	Add a FactoryTalk security user, a Windows-linked user, or a Windows-linked group to the current running application. For details, see Add a user or group on page 270.
Delete User/Group button	Delete a FactoryTalk security user, a Windows-linked user, or a Windows-linked group from the current running application. For details, see Delete a user or group on page 272.
Modify Group Membership button	Add a FactoryTalk user, a Windows-linked user, or a Windows-linked group to the current running application, or remove from the application. For details, see Modify a user or group membership on page 274.
Unlock User button	Unlock a FactoryTalk user account, which has been locked from the current running application. For details, see Unlock a user on page 275.
Enable User button	Enable a disabled FactoryTalk user account from the current running application. For details, see Enable a user on page 277.
Disable User button	Disable a FactoryTalk user account from the current running application. For details, see Disable a user on page 276.
Change User Properties button	Modify a FactoryTalk user's properties in the current running application. For details, see Change User Properties on page 277.
Shutdown button	Stop the application and shut down FactoryTalk View ME Station. For details, see Shutdown buttons on page 219.
Goto configure mode button	Stop the application and open the **FactoryTalk View ME Station** dialog box. For details, see Goto configure mode buttons on page 216.
Print alarm history button	Print a report of alarm messages in the alarm log file. You can print a report for all alarms, or for a specified alarm trigger. For details, see Set up Print Alarm History buttons on page 446.
Print alarm status button	Print a report of the status of alarms, including how many times each alarm was triggered and the time in alarm. You can print a report for all alarms, or for a specified alarm trigger. For details, see Set up Print Alarm Status buttons on page 447.

Start and control processes

Use this graphic object	To do this
Momentary push button	Start a process or action by sending one value to the tag when pressed, and another value when released. For details, see Set up Momentary push buttons on page 407.
Maintained push button	Toggle between two values by sending one value to the tag when pressed, and a second value the next time the button is pressed and released. This button is useful for changing a setting within a machine or process, but not for starting the machine or process. For details, see Set up Maintained push buttons on page 408.
Latched push button	Start a machine or process. The button remains set (latched) until the process is complete. For example, use this button to start a bag filling machine. When the process is complete (the bag is full), the button is reset (unlatched) by the **Handshake** connection. For details, see Set up Latched push buttons on page 410.
Multistate push button	Cycle through a series of values. Each time the operator presses the button, the value for the next state is sent to the tag. When the button is in its last state, pressing it changes the button to its first state and writes out the first state value. This button is useful when you want the operator to see and select multiple options in sequence, using a single button. The button shows the current state of an operation by showing a different color, caption, or image to reflect the different states. For details, see Set up Multistate push buttons on page 412.
Interlocked push button	Use a group of buttons to send values to the same tag. When the operator presses one button in the group, the button's value is sent to the tag, and the button remains highlighted as long as the tag value is the same as the button's value. Pressing another button in the group releases the first button, and sends a new value to the tag. For details, see Set up Interlocked push buttons on page 414. You can also use a single Interlocked push button to send a value to a tag.
Ramp button	Increase or decrease the value of a tag by a specified integer or floating-point value. For example, use two Ramp buttons together to create a raise/lower control. For details, see Set up Ramp buttons on page 415.
Control list selector	Select from a list of states for a process or operation. The list is highlighted to show the current state, and the operator can scroll through the list to select a different state. The value assigned to the selected state is written to the tag. For details, see Set up control list selectors on page 438.

Use this graphic object	To do this
Piloted control list selector	Select from a list of states for a process or operation. The list is highlighted to show the current state, and the operator or a remote device such as a programmable controller can scroll through the list to select a different state . For details, see Set up piloted control list selectors on page 440.
Drawing object with horizontal or vertical slider animation	Set the value of a tag by dragging the slider object. The pixel position of the slider is translated into a value that is written to the tag. If the value of the tag is changed at the data source, the position of the slider changes to reflect this. For information about animation, see Animate graphic objects on page 457.
ActiveX object	Change tag values using a third-party object connected to an analog, digital, or string tag, including both HMI and data server tags. When the object's property value changes, the new value is written to the associated tag. For details, see Use ActiveX objects on page 353.

Show processes and values graphically

Use this graphic object	To show this
Bar graph	Numeric values in bar graph format. The bar graph increases or decreases in size to show the changing value. For details, see Set up bar graphs on page 435.
Gauge	Numeric values in dial format. The gauge's needle moves around the dial to show the changing value. For details, see Set up gauges on page 436.
Scale	A static indication of the range of values for a bar graph. For details, see Set up scales on page 437.
Multistate indicator	The state of a process, on a panel that changes its color, image, or caption to indicate the current state. Each state is set up to correspond to a numeric tag value. For details, see Set up multistate indicators on page 428.
Symbol	The state of a process, using a monochrome image that changes color to indicate the current state. Each state corresponds to a numeric tag value. This object is useful for showing the state of a process or operation at a glance. For details, see Set up symbols on page 430.

Use this graphic object	To show this
List indicator	The state of a process, using a list of possible states with the current state highlighted. Each state is represented by a caption in the list, and corresponds to a numeric tag value. This indicator is useful if you want to view the current state, but also want to see the other possible states. For sequential processes, the list can alert the operator about what happens next in the process. For details, see Set up list indicators on page 431.
Trend	Historical or current numeric tag values, plotted against time or shown in an XY plot (where one or more tags' values are plotted against another tag's values to show the relationship between them). For details, see Set up trends on page 535.
Time and date display	Display the current time and date. For details, see Set up time and date displays on page 445.
ActiveX object	Data using a third-party object connected to an analog, digital, or string tag, including both HMI and data server tags. The format of the data shown depends on the object. For details, see Use ActiveX objects on page 353.
Drawing object with rotation, width, height, fill, color, or horizontal or vertical position animation	The value of a tag using a pictorial representation of the current value in relation to a range of possible values. For example, use rotation animation to show the tag value as a needle's position on a dial. For color animation, assign different colors to represent different values. For information about animation, see Animate graphic objects on page 457.

Work with lists, trends, alarm banners, and numeric input objects

Use this button	With this graphic object	To do this
Pause button	Trend	Toggle a trend between pausing and automatic scrolling.
Next pen button	Trend	Change the vertical axis labels for a trend to the scale for the next pen.
Backspace button	Control list selector Piloted control list selector	Move the cursor back to the highlighted item in the list.
End button	Lists and trends	**List** — move to the bottom item in the list. **Trend** — resume trend scrolling and move to the current (latest) data in the trend.

Use this button	With this graphic object	To do this
Enter button	Lists Alarm list and alarm banner	Select the item the cursor is pointing to. Acknowledge the currently selected alarm.
Home button	Lists and trends	**List** — move to the top item in the list. Trend — pause the trend and move to the earliest data in the trend.
Move left / right buttons	Trend, Diagnostics list	**Trend** — Pause the trend and scroll to the left or right. **Diagnostics list** — scroll the diagnostic message content across the display to view the full content.
Move up / down buttons	Lists, trends, and numeric input objects	**List** — move up or down one item in the list. **Trend** — scroll up or down to show higher or lower values on the vertical scale. **Numeric input cursor point** and **Numeric Input Enable** button — ramp the value up or down.
Page up / down buttons	Lists	Move up or down one page in the list.
Acknowledge alarm button	Alarm list Alarm banner	Acknowledge and silence the selected alarm.
Alarm status mode button	Alarm status list	Change the type of alarms shown in the alarm status list, from all alarms to active alarms to past alarms.
Clear alarm banner button	Alarm banner	Clear the alarm in the alarm banner without removing the alarm from the alarm log file and alarm lists.
Diagnostics clear button	Diagnostics list	Remove the selected message from all diagnostics lists.
Information acknowledge button	Information message display	Acknowledge the current message in the display.

For more information about using the buttons with lists and trends:

For information about	See
Link a button to a specific list, alarm banner, or trend object	Link buttons to objects on page 397
Use buttons with alarm lists, alarm banners, and alarm status lists	Use buttons with the alarm history and alarm objects on page 154
Use buttons with information message displays	Buttons in the [INFORMATION] display on page 530
Use buttons with diagnostics lists	Use buttons with the diagnostics list on page 173

For information about	See
Use buttons with trends	Use buttons to control the trend at run time on page 545

Unlike the buttons in the previous table, the following buttons do not work with specific graphic objects. You can use them to work directly with alarms in the alarm history and with the application's diagnostics messages.

Use this button	To do this
Acknowledge all alarms button	Acknowledge and silence all currently unacknowledged alarms, or the alarms for a specific alarm trigger.
Clear alarm history button	Remove alarms from the alarm log file and all alarm lists. You can remove all alarms, or just the alarms for a specific alarm trigger. You can also reset the cleared alarms. This resets the number of times an alarm has been triggered to 0, and the accumulated time in alarm to 0.
Reset alarm status button	Reset the number of times an alarm has been triggered to 0, and the accumulated time in alarm to 0, for all alarms.
Silence alarms button	Silence the audio indicator for all current alarms (on personal computers only).
Sort alarms button	Toggle between sorting alarms in alarm lists and the alarm log file by time and by trigger value.
Diagnostics clear all button	Remove all diagnostics messages from all diagnostic lists.

Enter and show numeric and string values

Use this graphic object	To do this
Numeric input enable button	Enter a numeric value and then write the value to a tag or an expression, or ramp a value at the data source. For details, see Set up Numeric Input Enable buttons on page 418.
Numeric input cursor point	Enter a numeric value and then write the value to a tag or an expression, or ramp a value at the data source. For details, see Set up numeric input cursor points on page 420.
String Input Enable button	Enter a string value and then write the value to a tag. For details, see Set up String Input Enable buttons on page 423.
Numeric display	Display numeric tag values. For example, show the current temperature of an oven. For details, see Set up numeric displays on page 417.

Use this graphic object	To do this
String display	Display string tag values. For example, set up the data source to generate strings that report on the state of a process of operation, or that provide the operator with instructions about what to do next. For details, see Set up string displays on page 422.
RecipePlus button	Display data set and tag values for ingredients in the **RecipePlus** table. Write tag values from the selected data set to the data source. Write tag values from the data source to the selected data set or to a new data set. Save data set values from the table to a recipe file. Rename or delete recipe units. For details, see RecipePlus button on page 549.
RecipePlus selector	Select the recipe unit to show, download from, write to, rename, or delete. For details, see RecipePlus selector on page 548.
RecipePlus table	Display and compare recipe data set values and tag values. Edit data set values For details, see RecipePlus table on page 548.
ActiveX object	Enter or show data using a third-party object connected to an analog, digital, or string tag, including both HMI and data server tags. The format of the data entered or shown depends on the object. For details, see Use ActiveX objects on page 353.

Show alarms and messages

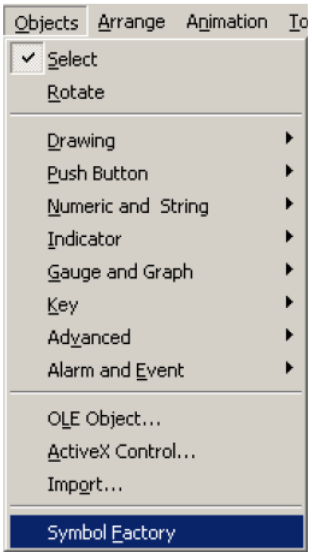
Use this graphic object	To show this
Alarm list	Multiple alarm messages, including the time the alarms are triggered and acknowledged. For details, see How the alarm list graphic object works on page 150.
Alarm banner	A single unacknowledged alarm message. For details, see How the alarm banner graphic object works on page 152.
Alarm status list	The status of alarms, including how many times an alarm has been triggered and how long it has been active. For details, see How the alarm status list graphic object works on page 153.
Diagnostics list	Messages about system activity such as tag reads, tag writes, and communications errors. For details, see How the diagnostics list graphic object works on page 173.
Information message display	Messages about the process, prompts or instructions, and information about current states. For details, see The information message display graphic object on page 530.

Use this graphic object	To show this
Local message display	Ongoing information about the status of devices or processes. For details, see How the local message display graphic object works on page 329.

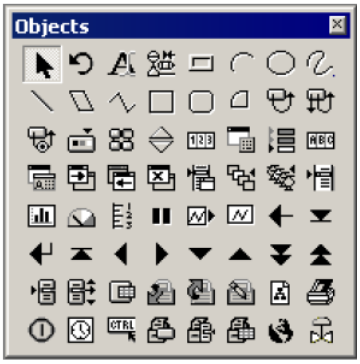
Select tools for creating graphic objects

The **Objects** menu in the **Graphics** editor contains items for creating objects, as well as items for selecting and rotating objects. You can also create most objects using the tools on the Objects toolbar.

Objects menu



Objects toolbar



Before you can create an object, you must select the object's tool, either by clicking a menu item or by clicking the tool on the toolbar. When you position a cursor over a tool on the toolbar, the name of the tool is shown in a tooltip and in the status bar.

To select a tool

- Click the tool on the toolbar, or select the tool from the **Objects** menu. When you click a tool, the pointer changes to show which tool is active.

Freehand tool

Text tool

To deselect a tool, do one of the following

- Double-click an empty area in the display.
- Click the Select tool .
- Click another tool.

For some drawing objects, double-clicking an empty area of the display creates another instance of the object. For these objects, to finish drawing, click the Select tool. For more information, see Creating drawing objects on page 343.

Before you begin creating objects

To size and position objects precisely as you create them, use the grid.

To use the grid

- From the **View** menu, select **Show Grid** > **Snap On**.

  For information about setting up the grid, see Use the grid on page 306.

For information about setting up graphic objects once you have created them, see Set up graphic objects on page 389.

For information about attaching animation to the objects you create, see Animate graphic objects on page 457.

Create graphic objects

This section applies to graphic objects in general.

ActiveX objects and some drawing objects require extra steps to create them. For details about creating drawing objects, see the next section. For information about ActiveX objects, see Use ActiveX objects on page 353.

To create a graphic object

1. Select the tool for the object to create.
2. Click the mouse where you want to position the object, and then drag to draw a rectangle the general size you want the object to be.
3. Double-click the object to open its **Properties** dialog box.
4. In the dialog box, specify how the object looks, its behavior, and connections. For more information about the **Properties** dialog box, see Use the Properties dialog box on page 358.

You can also use the **Property Panel** to set up objects. For information about using the **Property Panel**, see Use the Property Panel on page 360.

Create drawing objects

The following instructions for creating drawing objects describe how to create the objects and then open the objects' **Properties** dialog boxes to set up how the objects look. For information about using the **Properties** dialog box, see Use the Properties dialog box on page 358.

You can also use the **Property Panel** to set up objects. For information about using the **Property Panel**, see Use the Property Panel on page 360.

Create text

Choose fonts

You can select any font you have installed, but **TrueType** and **OpenType** fonts are recommended. These fonts can be resized easily, without losing text quality.

For PanelView Plus and PanelView Plus CE terminals, you must use **TrueType** fonts.

If you run an application on a computer that does not have the fonts you used when setting up the application, Windows substitutes with the fonts that most closely match the fonts you specified.

Choose fonts for language switching

If you are going to use the application with multiple languages, we recommend using Microsoft Sans Serif or Tahoma. These fonts allow for font linking to support the character sets of other languages. PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, and PanelView Plus CE terminals are shipped with font linking turned on.

For more information about font linking, see Help. For more information about setting up languages for your application, see Set up language switching on page 197.

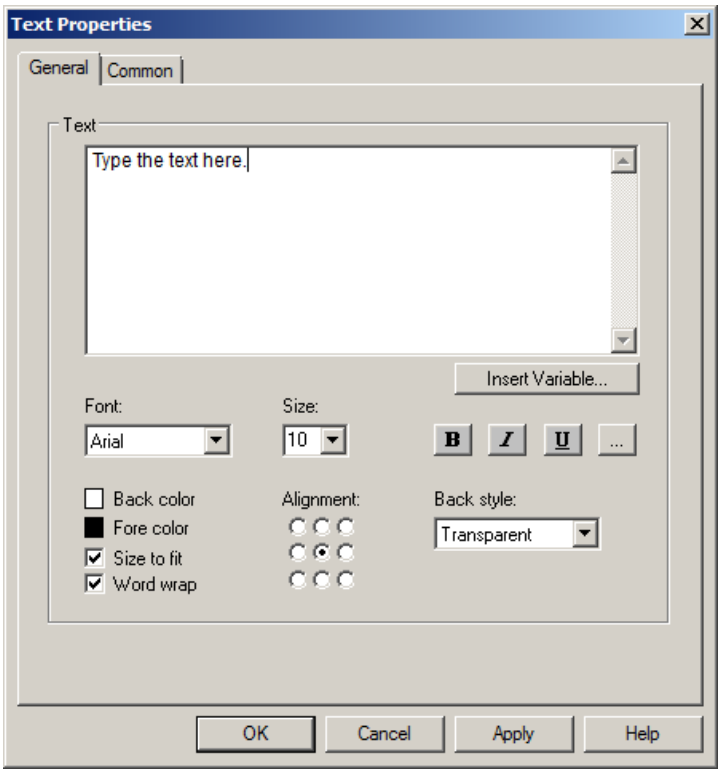
Use the Size to fit option

If you use the Size to fit option, the size of the text object will likely change for different languages. Make sure you check all displays containing translated language strings.

To create a text object

1. Select the **Text** tool .
2. Click the mouse where you want to position the text, and then drag to draw a rectangle.

   The **Text Properties** dialog box opens.



3. Select text options.

   For information about the options in the dialog box, see Help.
4. To close the dialog box, click **OK**.

   The text is positioned where you drew the rectangle.
5. To create another text object, move to a new area in the display, and then repeat steps 2 through 4.

After you have set up one text object to look the way you want, copy and paste it to create additional text objects with the same formatting. Then edit the text of the new objects.

To edit a text object

1. Double-click the text.

   The **Text Properties** dialog box opens.

2. In the **Text** box, click where you want to make the change. To delete text characters, use the **Backspace** and **Delete** keys.

Create images

Use the image graphic object to place images in your graphic displays. Images support visibility animation only. You can use images already contained in the Images folder or use Symbol Factory to select and add a graphic to the display and the Images folder.

Use bitmaps, PNG, and JPEG images

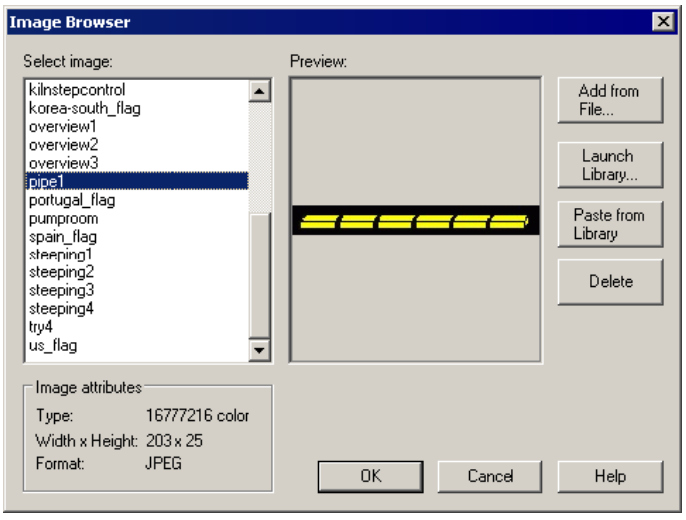
Before you can place a bitmap, PNG, or JPEG image in a display, you must import the image into your application. For more information, see Import bitmap, PNG, and JPEG images on page 320.

To place a bitmap, PNG, or JPEG image in a display

1. Select the Image tool .

2. Click the mouse where you want to position the image, and then drag to draw a rectangle.

   The **Image Browser** opens.



3. In the **Select image** list, click the image to place, and then click **OK**.

For more information about using the **Image Browser**, see Use the Image Browser to import images on page 322.

The image is placed where you drew the rectangle, but the actual size of the image is used, rather than the size of the rectangle you drew.

4. To change the image's attributes, double-click the image to open the **Image Properties** dialog box.
5. Select image options.

   For information about the options in the dialog box, see Help.
6. Click **OK** to close the dialog box.

To add an image from Symbol Factory to a graphic object using the image browser:

1. In the graphic display, draw the graphic object you are going to import an image for. The **Image Browser** will open.
2. In the **Image Browser**, click **Launch Library...** Symbol Factory will open as a new window.
3. Browse the Categories frame, clicking on a category to see the symbols in the right frame.
4. Click on the graphic to select it for the Graphic Display.
5. Click **Copy**, the Symbol Factory minimizes, returning to the **Image Browser**.
6. Click the **Paste from Library** button. A dialog box **Image Name Entry** will open.
7. Type in an unique name for the image, then click the **OK** button.
8. The graphic will now be shown in the Preview window. The graphic has been added to the list in the **Image Browser**. This also adds the image to the Images folder in the **Explorer** window.
9. Click **OK** to close the **Image Browser**. The image will be in the Graphic Display.

Symbol Factory objects imported by the **Image Browser** will by saved in the Images folder as a bitmap.

Create panels

Panels support visibility animation only.

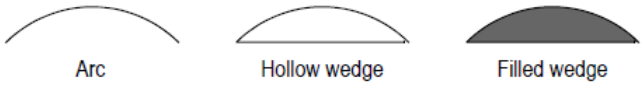
To create a panel

1. Select the Panel tool .
2. Click the mouse where you want to position the panel, and then drag to draw a rectangle the general size you want the panel to be.
3. To change how the panel looks, double-click the panel to open the **Panel Properties** dialog box.
4. Select panel options.

   For information about the options in the dialog box, see Help.
5. To close the dialog box, click **OK**.

Create arcs and wedges

Arcs and wedges are drawn in two steps: first you create an ellipse or circle, and then you reshape it into the segment you want.

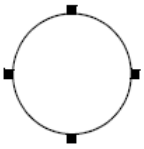


To create an arc or wedge

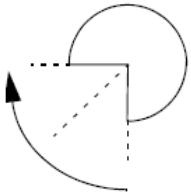
1. Select the Arc or Wedge tool .
2. Click the mouse where you want to position the object, and then drag to draw an ellipse or circle.

   To base the arc or wedge on a circle rather than an ellipse, hold down Ctrl while you drag.

When you release the mouse button, a set of handles appears so you can decrease the angle of the wedge or arc from 360 degrees to the desired angle.



3. Click a handle, and drag the mouse to 'cut out' part of the circle.



4. To finish drawing, click the object.
5. To change how the object looks, click **Properties** on the context menu, or double-click the object to open its **Properties** dialog box.
6. Select arc or wedge options.

   For information about the options in the dialog box, see Help.
7. To close the dialog box, click **OK**.

You can also use the Arc and Wedge tools to reshape arcs and wedges. For more information, see Reshape drawing objects on page 377.

Create ellipses and circles

Use the Ellipse tool to draw an ellipse or circle.

To create an ellipse or circle

1. Select the Ellipse tool .
2. Click the mouse where you want to position the object, and then drag to draw an ellipse or circle of the desired size.

   To draw a circle, hold down **Ctrl** while you drag.
3. To change how the object looks, double-click it to open the object's **Properties** dialog box.

4. Select circle or ellipse options.

   For information about the options in the dialog box, see Help.

5. To close the dialog box, click **OK**.

Create freehand shapes

Using the Freehand tool is similar to drawing with a pen on paper.

To create a freehand shape

1. Select the Freehand tool .
2. Click and drag to create the shape you want.
3. To change how the object looks, double-click it to open the **Freehand Properties** dialog box.
4. Select freehand options.

   For information about the options in the dialog box, see Help.

5. To close the dialog box, click **OK**.

Create lines

To create a line

1. Select the Line tool .
2. Click where you want the line to start, and then drag from the beginning point to the end point.

   To draw horizontal or vertical lines, hold down Ctrl while you drag the mouse.

3. To change how the line looks, right-click the line and then click **Properties** on the context menu. The **Line Properties** dialog box opens.
4. Select line options.

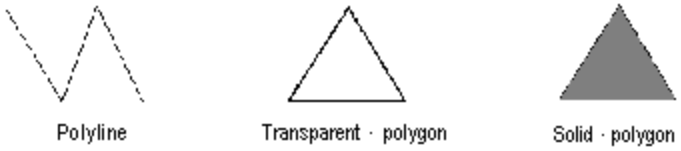
   For information about the options in the dialog box, see Help.

5. To close the dialog box, click **OK**.

You can use the Polyline tool to convert the line into a polyline. For more information, see Reshape drawing objects on page 377.

Create polygons and polylines

A polyline is a series of connected line segments. A polygon is a multi-sided object (with three or more sides). For example, use the polygon shape if you want to create triangles.



To create a polygon or polyline

1. Select the Polygon or Polyline tool .
2. Click and drag to create the first segment of the object. Release the mouse button.

   To draw horizontal or vertical lines, hold down **Ctrl** while you drag.

3. Move the mouse to where you want the next segment to end, and then click.

   Repeat this step until you have completed the object.

4. To finish drawing, double-click an empty area of the display, or click the Select tool.
5. To change how the object looks, double-click it to open the object's **Properties** dialog box.
6. Select polygon or polyline options.

   For information about the options in the dialog box, see Help.

7. To close the dialog box, click **OK**.

You can use the Polygon tool to reshape lines, polygons, polylines, and rectangles. For more information, see Reshape drawing objects on page 377.

Create rectangles and squares

To create a rectangle or square

1. Select the Rectangle tool .
2. Click the mouse where you want to position the object, and then drag until the rectangle or square is the size you want.

   To draw a square, hold down **Ctrl** while you drag.
3. To change how the object looks, double-click it to open the object's **Properties** dialog box.
4. Select rectangle or square options.

   For information about the options in the dialog box, see Help.
5. To close the dialog box, click **OK**.

You can use the Polygon tool to reshape the rectangle into a polygon. For more information, see Reshape drawing objects on page 377.

Create rounded rectangles and squares

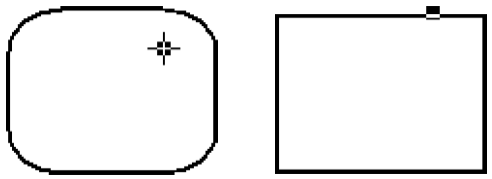
Due to a Windows limitation, you cannot rotate rounded rectangles and rounded squares.

To create a rounded rectangle or square

1. Select the Rounded Rectangle tool .
2. Click the mouse where you want to position the object, and then drag until the rectangle or square is the size you want.

   To draw a square, hold down **Ctrl** while you drag.

3. You can change how rounded the corners are by using the handle that appears inside the rounded rectangle. Click the handle and drag inward to increase roundedness, or outward to decrease roundedness.



4. To finish drawing, click the object.

5. To change how the object looks, click **Properties** on the context menu, or double-click the object to open its **Properties** dialog box.

6. Select rounded rectangle or square options.

   For information about the options in the dialog box, see Help.

7. To close the dialog box, click **OK**.

For information about using the Rounded Rectangle tool to reshape the rounded rectangle, see To reshape rounded rectangles on page 378.

Use .wmf and .dxf files

Windows metafiles (.wmf) and AutoCAD (.dxf) files are converted to drawing objects (such as lines, ellipses, and polygons) when you import them. You can edit the drawing objects the same way you edit drawing objects that you create in FactoryTalk View.

Depending on the complexity of the metafile or AutoCAD file, the converted image could consist of 500 or more drawing objects. This would lead to long display load times. In this case, it would be better to covert the .wmf or .dxf file to a bitmap, and then show the bitmap in an image object.

To place a .wmf or .dxf file in a display

1. From the Objects menu, select **Import**.

2. Click the mouse where you want to position the file, and then drag to draw a rectangle.

3. In the **Files of type** box, select the type of file to import.

4. Navigate to the directory where the file is stored, and then click the file to import.

5. Click **Open**.

   The file is converted to drawing objects and grouped, and then the grouped object is placed in the graphic display.

Use ActiveX objects

ActiveX objects use tags or expressions to exchange information with the data source.

The properties and connections available for a particular ActiveX object depend on the third-party vendor's implementation.

ActiveX objects support visibility animation only.

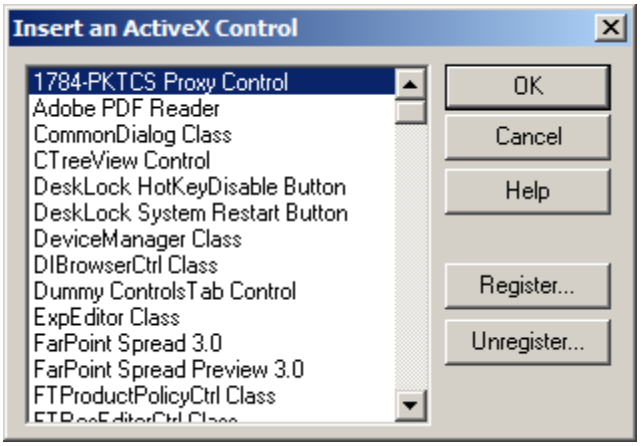
If your application will run on a PanelView Plus CE terminal, the ActiveX object must be available for both the development system (running on Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) and the PanelView Plus CE terminal platform. Make sure you install and register the Windows CE version of the ActiveX object on the PanelView Plus CE.

PanelView Plus terminals do not support ActiveX objects.

To create an ActiveX object

1. Select the ActiveX Control tool .

2. Click the mouse where you want to position the object, and then drag until the object is the size you want.



3. In the dialog box that opens, select the object to add to your graphic display.

For information about the options in the dialog box, see Help.

4. Click **OK**.

   The object is placed in the display. Depending on how the third party implemented the object, it might be a different size than the rectangle you drew.

5. To specify the object's properties and assign tags or expressions to its connections, do one of the following:

   - Right-click the object, and then select **Properties** to open the object's **Properties** dialog box.

     Depending on how the third party implemented the object, it might not have a **Properties** dialog box. If the **Properties** menu item is not available, use the next method.

   - Right-click the object, and then click **Property Panel**.

6. In the **Properties** dialog box or **Properties** tab of the **Property Panel**, specify the object's properties.

7. If desired, set up the properties in the **Common** tab, as described on Set up objects' spatial properties, names, and visibility on page 389.

8. In the Connections tab, assign tags or expressions to the object's connections.

9. To close the **Properties** dialog box, click **OK**. To close the **Property Panel**, click the **Close** button.

For information about using the **Properties** dialog box, see Use the Properties dialog box on page 358.

For information about using the **Property Panel**, see Use the Property Panel on page 360.

Tools and tips for working with objects

This section describes features of the **Graphics** editor that help you work with the objects you create. It describes how to:

- Select and deselect objects.
- Use the Object Explorer to view and select objects.
- Use an object's **Properties** dialog box to set up the object's properties and assign tags and expressions to its connections.
- Use the **Property Panel** to set up individual and group object properties, and to assign tags and expressions to individual objects' connections.
- Color objects.

- Name objects.
- Test how objects look in different states.

Select and deselect objects

To work with an object, you must first select it. You can use the Select tool or the Object Explorer to select objects.

For information about using the Object Explorer, see Use the Object Explorer on page 356.

To select the Select tool

- From the **Objects** menu, select **Select**, or on the Objects toolbar click the Select tool .

  The mouse pointer changes to a single arrow.

Select objects

To select	Do this
An object or group of objects	Click the object or group. In the Object Explorer, click the object or group.
An object within a group of objects	Double-click the group, and then click the object. In the Object Explorer, open the group, and then click the object.
Several objects	Click the first object, and then Ctrl-click additional objects.
All objects in an area	Click and drag diagonally to draw a selection border around the objects. Ctrl-click objects outside the border to add them to the selection.
All objects in the drawing area or in a group you are editing	On the Edit menu, click Select All, or press Ctrl+A.

Deselect objects

To deselect	Do this
An object	Ctrl-click the object.
Several objects	Press and hold Ctrl, and then drag a selection border around the objects.
All selected objects	Click in the Drawing area, away from any objects.

Use the Object Explorer

Use the Object Explorer to view and select objects from a tree-list of all the objects in a display. Groups are listed as expandable items in the tree, with a + icon.

Use the Object Explorer to select an object that is hidden behind other objects in the display, without bringing the object to the front. Objects are listed in front-to-back order. The object you created most recently is at the front, unless you move it back using the Send to Back option. For more information about layering objects, see Layer objects on page 381.

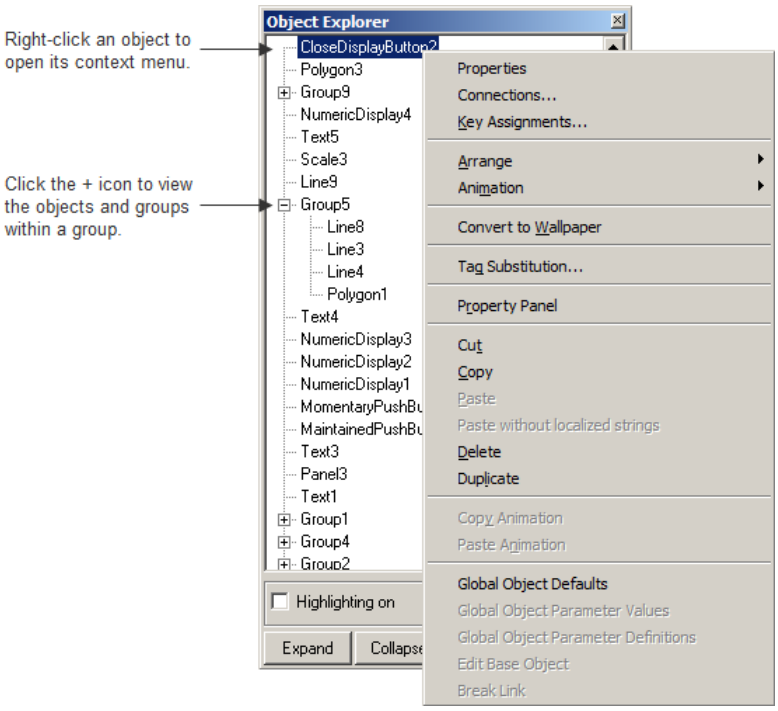
You can also use the Object Explorer to highlight objects by object type, highlight objects that have animation attached, and to highlight objects with specific tag or expression assignments. For more information, see Highlight objects in the Object Explorer on page 357.

The Object Explorer does not show wallpaper objects, nor objects within ActiveX composite objects.

To open the Object Explorer, use one of these methods

- On the **Graphics** toolbar, click the Object Explorer tool .
- From the **View** menu, select **Object Explorer**.

- Right-click an object, and then click **Object Explorer**.



You can keep the Object Explorer open as you work in the **Graphics** editor. For more information about using the Object Explorer, see Help.

Highlight objects in the Object Explorer

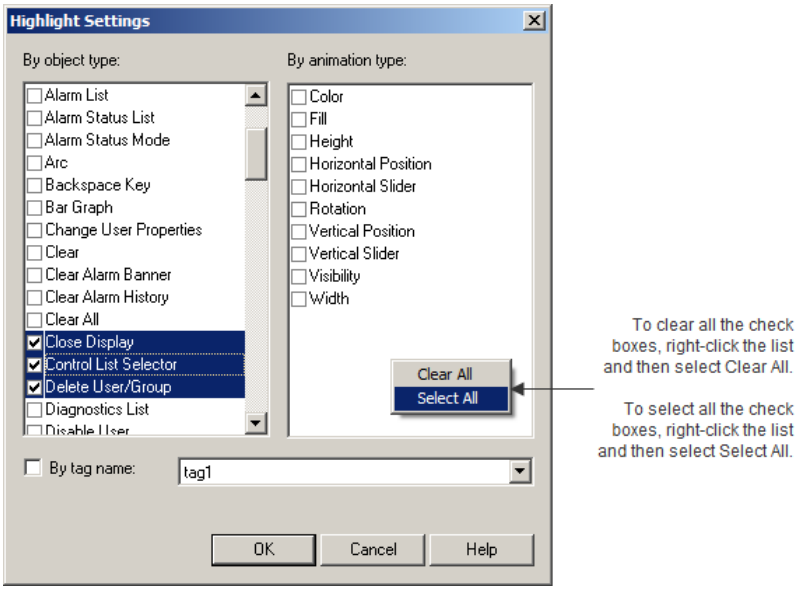
You can use the Object Explorer to highlight:

- Specific types of objects
- Objects that have animation attached
- Objects that have a specific tag or expression assigned to them

The objects are highlighted in red in the Object Explorer and in the graphic display. If your graphic display uses a red background, the highlighting is not visible in the graphic display.

To highlight objects in the Object Explorer

- In the Object Explorer, click **Highlighting on**, and then click **Settings**.



For details about the options in the **Highlight Settings** dialog box, see Help.

Use the Properties dialog box

Every graphic object has a **Properties** dialog box that you can use to set up the object. Depending on how the vendor implemented the object, third-party ActiveX objects might have a **Properties** dialog box as well.

The **Properties** dialog box contains tabs that you can use to set up the object's properties and connections:

In this tab	Do this
General	Set up the object's appearance, audio indicator, and touch margins (for buttons), and settings that are unique to the object, such as the button action for a push button, whether to use key navigation to select the object, or whether to link a button to a specific object. For information about touch margins, see Use touch margins on page 392. For information about key navigation, see Remove objects from and adding objects to the tab sequence on page 396. For information about linking buttons to objects, see Link buttons to objects on page 397.
States	Set up the states for the object, including the value for each state and whether to show a caption or image for the state. For information about checking that the states are set up the way you intended, see Test how objects look in different states on page 365.

In this tab	Do this
Label	For objects that don't have multiple states, specify whether to use a caption or image on the object. For information about using the **Image Browser** to select an image to use in the label, see Use the Image Browser to import images on page 322.
Timing	Set up the object's auto repeat (see Repeat a button's action by holding down the button on page 399), or **Enter key handshaking** (see Ensure values are read by the data source before sending new values on page 400) settings.
Common	Set up the object's spatial properties, name and visibility. For details, see Set up objects' spatial properties, names, and visibility on page 389.
Connections	Assign tags and expressions to the object's connections. For information, see Assign tags and expressions to graphic objects on page 366.

The tabs that are available depend on the object:

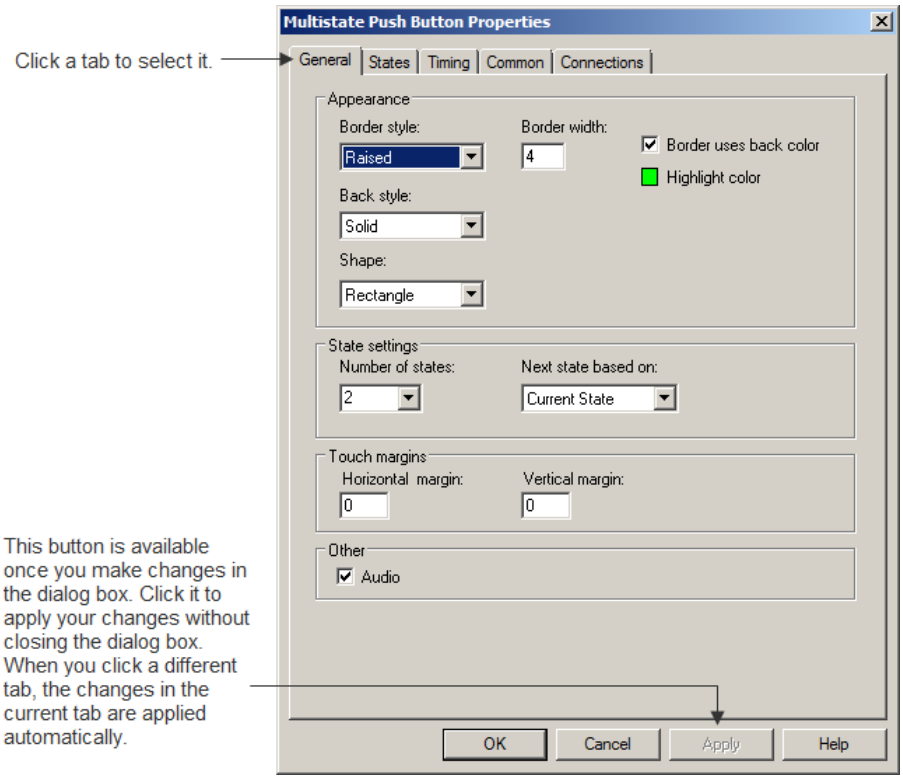
- Some objects have only General and Common tabs.
- If an object can have more than one state, the object's **Properties** dialog box contains a States tab.
- Some objects have unique tabs that are not listed in the table above.
- The tabs that an ActiveX object has depends on the vendor's implementation, though if you can assign tags or expressions to the object it has a **Connections** tab.

To open an object's Properties dialog box, use one of these methods

Note: To automatically open the object's property dialog box when you place the object on a display, use the **Settings** tab (**Tools** > **Options** >**Settings**).

- Double-click the object.
- Right-click the object, and then click **Properties**.
- Select the object, and then from the **Edit** menu, click **Properties**.
- In the **Property Panel**, with the object selected, click the **(Custom)** property and then click the **Browse** button .
- In the **Property Panel**, with the object selected, double-click the **(Custom)** property.

- In the Object Explorer, double-click the object.



You can also use the **Property Panel** to set up an object's properties, as described next.

For details about setting up a particular object, see Help.

Use the Property Panel

Use the **Property Panel** to modify the properties of graphic objects and assign tags and expressions to the objects.

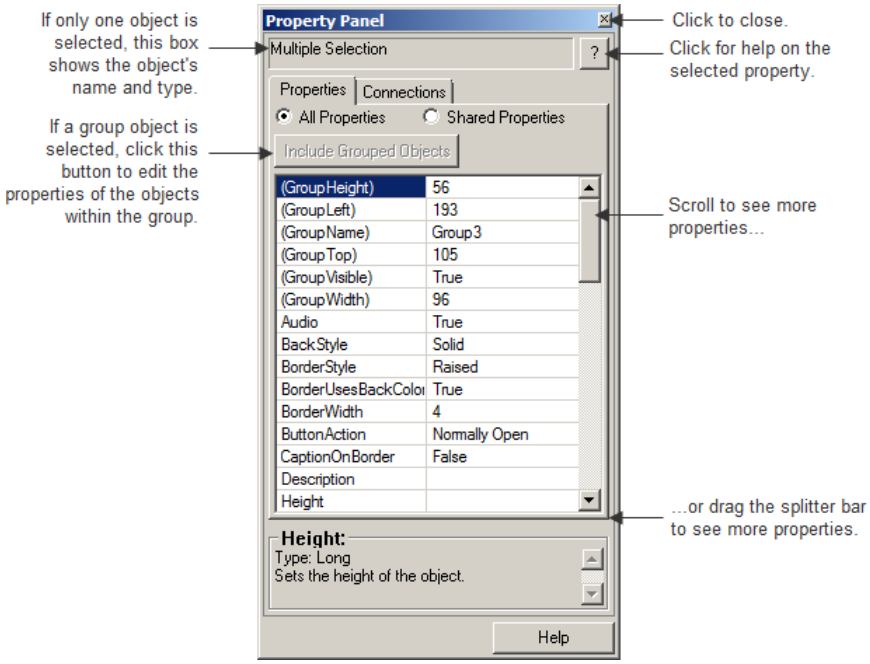
The **Property Panel** is especially useful for making changes to the properties of multiple objects at the same time.

To open the Property Panel, use one of these methods

- On the **Graphics** toolbar, click the Property Panel tool .
- From the **View** menu, click **Property Panel.**
- Right-click an object, and then select **Property Panel.**
- Right-click an empty area of the display, and then click **Property Panel.**

Set up properties

Use the **Properties** tab of **Property Panel** to set up the properties of the selected object or objects.



You can keep the **Property Panel** open as you work in the **Graphics** editor. You can drag the panel's borders to make the **Property Panel** larger or smaller.

For more information about using the **Property Panel** to set up an object's properties, see Help.

Assign tags and expressions to an object's connections

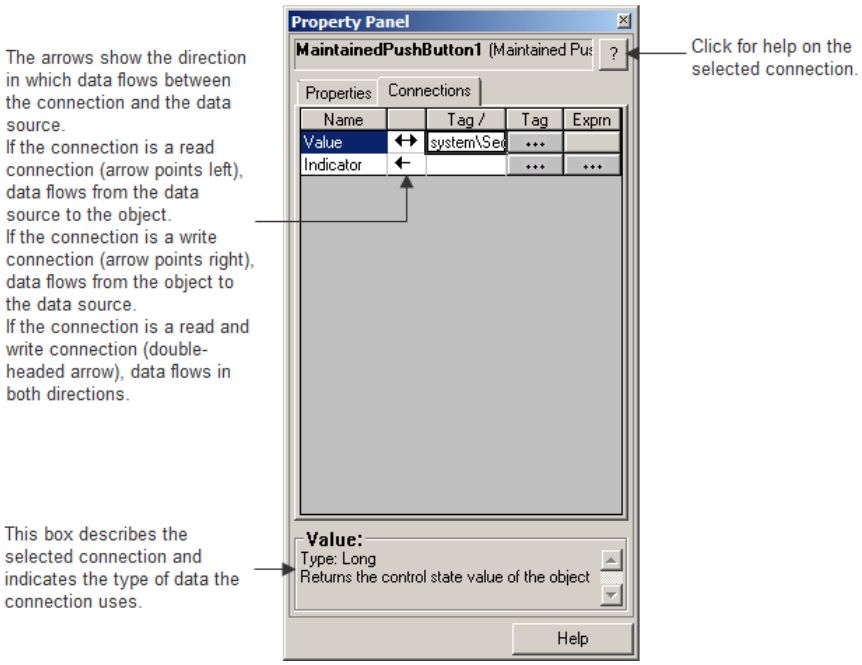
Use the **Connections** tab of **Property Panel** to assign tags or expressions to the selected object's connections. If multiple objects are selected the tab is blank, because you can assign tags or expressions to only one object at a time.

How values are updated

The arrows indicate the direction in which the data flows between the connection and the data source:

- A right arrow indicates that the connection sends values to the data source. The connection is a write connection.

- A left arrow indicates that the data source sends values to the connection. The connection is a read connection.
- A double arrow indicates that the data flows in both directions. The connection is a read-write connection.


The arrows show the direction in which data flows between the connection and the data source.
If the connection is a read connection (arrow points left), data flows from the data source to the object.
If the connection is a write connection (arrow points right), data flows from the object to the data source.
If the connection is a read and write connection (double-headed arrow), data flows in both directions.
This box describes the selected connection and indicates the type of data the connection uses.
Property Panel
MaintainedPushButton1 (Maintained Pus
?
Click for help on the selected connection.
Properties
Connections
Name
Tag /
Tag
Exprn
Value
system\Sec
Indicator
Value:
Type: Long
Returns the control state value of the object
Help

For more information about using the **Property Panel** to assign tags and expressions to an object's connections, see Help.

For more information about assigning tags and expressions to objects, see Assign tags and expressions to graphic objects on page 366.

Color objects using the color toolbars

The Foreground Color and Background Color toolbars contain a selection of colors you can assign to objects' color properties.

About color properties

The number of color properties an object has depends on the type of object and how you set it up. For example, a button with states can use up to seven different colors for each state. When you select colors using the color toolbars, some properties are assigned the foreground color and some are assigned the background color. Other color properties, such as Fill color, cannot be assigned using the color toolbars (instead, use the object's **Properties** dialog box or the **Property Panel**).

This table lists the color properties you can assign using the color toolbars:

Property	Foreground color	Background color
Back color	No	Yes
Background color	No	Yes
Border color	Yes	No
Caption color	Yes	No
Caption back color	No	Yes
Fore color	Yes	No
Foreground color	Yes	No
Image color	Yes	No
Image back color	No	Yes
Legend color	Yes	No
Needle color	Yes	No
Pattern color	Yes	No

For objects with states, the selected color is applied to the current state's color properties only. In the **Property Panel**, properties that apply to states have *St_* at the beginning of the property name.

When to select colors using the toolbars

For all the drawing objects except image and panel, you can select colors from the color toolbars before you draw an object (either before or after you click the object's tool).

The other objects are always drawn using their default colors, but you can select the objects and then click the toolbars to change their colors. The toolbars are especially useful for quickly assigning the same colors to multiple objects.

To show a color toolbar

- From the **View** menu, select **Toolbars**, and then click **Foreground Colors** or **Background Colors**.

To close a color toolbar

- From the **View** menu, select **Toolbars**, and then click **Foreground Colors** or **Background Colors**, or click the toolbar's **Close** button.

Other methods for assigning colors

You can also assign colors using an object's **Properties** dialog box or the **Property Panel**. Use one of these methods if you want to assign separate colors to different foreground or background color properties, or to choose colors that don't appear in the toolbars.

For example, if you want to use a dark blue background color for a button, with a light blue background color for its image label, you must assign the colors separately. Using the toolbar would assign the same color to both properties.

Also use the **Properties** dialog box or **Property Panel** to change the default colors for properties that cannot be assigned using the color toolbars.

Name objects

Objects (and groups of objects) are automatically given a name and number when you create them, for example NumericInputEnable4. If desired, you can assign a more meaningful name to the object, for example Conveyor_speed_input. Each object in a display must have a unique name.

The object name appears in the status bar, **Diagnostics List**, **Property Panel**, and **Object Explorer** in FactoryTalk View Studio, and in diagnostics log messages at run time.

To name an object in the Property Panel

1. Select the object.
2. In the **Property Panel**, click the **Properties** tab.
3. Double-click the (Name) row, and then type the name.

   The name must start with a letter, and cannot contain spaces. You can use the underscore character (_).

To name an object in its Properties dialog box

1. Double-click the object to open its **Properties** dialog box.
2. Click the **Common** tab.
3. In the **Name** box, type the name.

   The name must start with a letter, and cannot contain spaces. You can use the underscore character (_).

To name a group object

1. Select the group object.
2. In the **Property Panel**, click the **Properties** tab.
3. Double-click the **(GroupName)** row, and then type the name.

The name must start with a letter, and cannot contain spaces. You can use the underscore character (_).

Test how objects look in different states

To make sure the different states for an object are set up correctly, you can view them using the States toolbar or the **Property Panel**.

To open the States toolbar

- From the **View** menu, select **Toolbars**, and then click **States**.

To view an object's states using the States toolbar

1. Select one or more objects.
2. In the **States** toolbar, select the state to view.

   If you selected multiple objects, the toolbar shows the states that are common to all the objects.

3. To view the next state, select it in the toolbar or press the **Down Arrow** key on your keyboard.

   You can also use these keys to select the next state to view:

   - To view the previous state, press the **Up Arrow** key.
   - To view the first state, press the **Home** key.
   - To see the last state, press the **End** key.

To view an object's states using the Property Panel

1. Select one or more objects.
2. In the **Property Panel**, click the **State** property and then select the state to view.
3. To view the next state quickly, double-click the row, or press the **Enter** key on your keyboard.

Assign tags and expressions to graphic objects

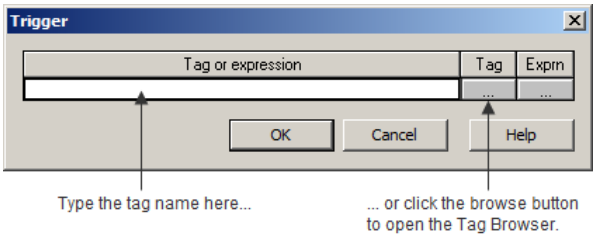
You can assign tags and expressions to many graphic objects, including ActiveX objects (depending, of course, on how the vendor implemented the object). This section describes how to:

- Assign tags to graphic objects.
- Use expressions to manipulate tag values.
- Replace tags using tag substitution.
- Use tag placeholders so the same display can be used with different sets of tags.

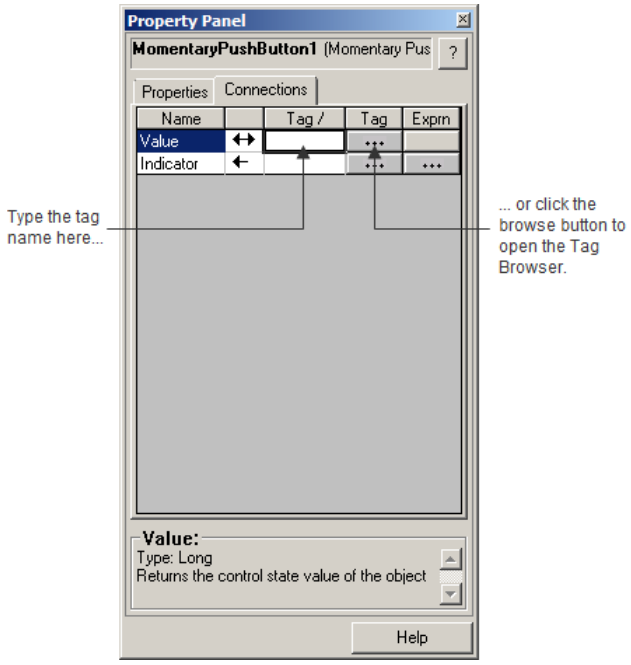
Assign tags

To assign tags to a graphic object, use one of these methods:

- Double-click the object to open the object's **Properties** dialog box, and then assign tags in the **Connections** tab.



- Select the object and then assign tags in the **Connections** tab of the **Property Panel**.



- Select the object, and then from the **Edit** menu, select **Connections**. Assign tags in the **Connections** tab of the **Properties** dialog box.
- Right-click the object, and then select **Connections**. Assign tags in the **Connections** tab of the **Properties** dialog box.

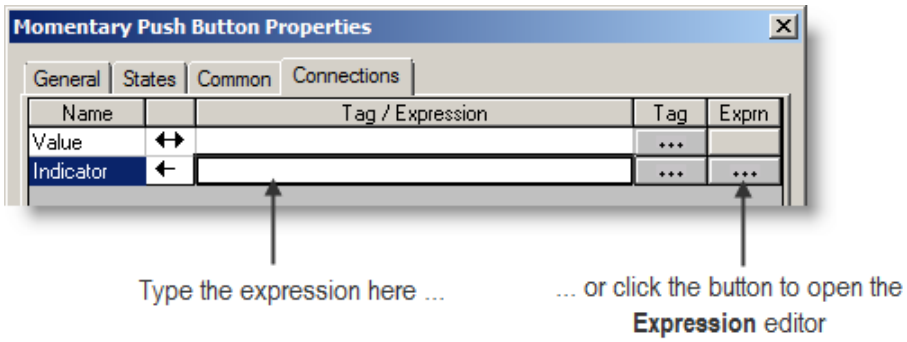
For information about:

- Use the **Tag Browser**, see Use the Tag Browser on page 90.
- Use the **Properties** dialog box, see Use the Properties dialog box on page 358.
- Use the **Property Panel**, see Use the Property Panel on page 360.

Use expressions to manipulate tag values

Many of the connections to which you can assign a tag also permit the use of expressions to perform logical or mathematical calculations on tag values. If you assign an expression, FactoryTalk View monitors the expression value rather than the original tag value. For example, your machine might send values to the data source in the form of temperature in degrees Celsius. You could use an expression to convert the value to degrees Fahrenheit, and then monitor the expression result rather than the original tag value.

If you can assign an expression, a Browse button is present in the **Exprn** column in the **Connections** tab.



To specify an expression, do one of the following

- In the **Tag / Expression** column, type the expression.
- In the **Exprn** column, click the **Browse** button and then create an expression in the **Expression** editor. Use this method if you want to check the expression syntax, or to use multiple lines for the expression.

For more information about expressions, see Use expressions on page 475.

Replace tags using tag substitution

You can replace tags assigned to the graphic objects in your display by using tag substitution. You can also replace the tags used in expressions assigned to graphic objects.

For example, if you assign a tag called *HoistHeight* to multiple objects in the display, and then decide to use the tag Hoist_height instead, you can use tag substitution to quickly replace the old tag with the new tag.

You can replace:

- A tag name (with or without folder names)
- A folder name
- The text in an expression
- Tags contained in embedded variables

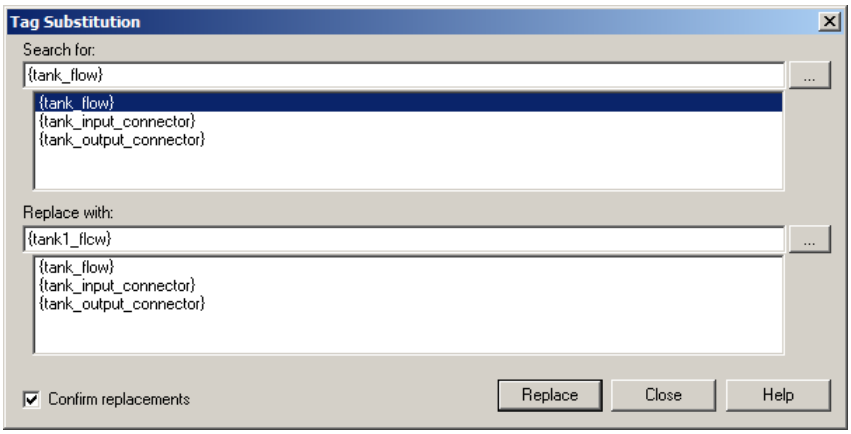
To replace tags

1. Select one or more objects.

   To select all the objects in the display, from the **Edit** menu, select **Select All**.

2. From the **Edit** menu, select **Tag Substitution**.

3. To replace the tags for a single object, you can right-click it and then select **Tag Substitution**.



For details about the options in the **Tag Substitution** dialog box, see Help.

A log file is shown after substitution. It provides details on the substitution process and results. If the substitution fails, the reason will be shown. The last line shows where the log file is located in case you want to review it in the future.

Replace tags using Find and Replace

You can replace tags or components that refer to tags using Find and Replace, a function that has been added with version 7.00.00.

To replace tags

1. From the tool bar, click , or select Replace from the Tools menu, or press CTRL+H.

2. Click the browse button ( ) next to **Find what,** which launches the **Tag Browser**.

   - Navigate to the correct folder in the left pane, and then select the tag in the right pane.
   - Click **OK** to save the selection and close the browser.

3. Click the browse button next to **Replace with.** Select the replacement tag from the **Tag Browser** and click OK to save the selection and close the browser.

4. Click on the browse button next to **Find within** and clear all the check boxes except Graphic Objects. Click **OK** to save the selection and close the dialog box.

5. Identify the word search limitations in **Find Options**.

6. Select the **Direction**, in which to search:

   - Select **Up** to search for the tag or text string in all components before the shown one.
   - Select **Down** to search for the tag or text string in all components after the shown one.

7. To replace items, select **Confirm replacement** if needed, then:

   - To select individual items to replace, click **Find Next** and then click **Replace**, when the correct item is shown or
   - To replace all tags, Click **Replace All** to replace all found items.

If needed, click the **View Log File** button to show a text file of the results of the Replace, Replace All or Undo Replace functions.

To undo replacements, click **Undo Replace**. Only the last replace or replace all action can be undone. Undo will not be successful if a component has been manually edited after the replace action.

Use tag placeholders

Tag placeholders provide a way to use one graphic display to represent a number of similar operations.

For example, suppose you are creating displays for a plant that cans corn and peas. The machinery used in both processes is identical. Instead of creating two displays and specifying corn-related tags in one display and pea-related tags in another, you can create one display and not specify any tag names. Where a tag name is required, type a tag placeholder.

You can use tag placeholders wherever you would normally assign a tag to an object, including in expressions and embedded variables. You can also use tag placeholders in the expressions you create to animate objects.

You can also use tag placeholders with global objects.

You can use tag placeholders in:

- The graphic display that opens when the application is first run.
- Graphic displays that are opened using a Goto display button.
- Graphic displays that are opened using a display list selector.
- The graphic display that opens when the logout button is pressed to log the logged-on user out.
- The graphic display specified in the **Project Settings Runtime** tab when auto logout is enabled.
- Graphic displays that are opened using the **Remote Display Number** global connection.

Use parameter files or parameter lists to specify which tags or folders to substitute for which placeholders. For global objects, you can specify the tags or folders of tags using global object parameters.

For more information about using parameter files, parameter lists, and global object parameters, see Use parameters and global objects on page 501.

Create tag placeholders

A tag placeholder is the cross-hatch character (#) followed by a number from 1 to 500.

The tag placeholder can replace any part of a tag name, including folder names. For example, you could create a parameter file specifying that the tag placeholder #1=Folder1. You could assign the folder and a tag name to a graphic object's connection: *#1\Tag1*.

You can assign tag placeholders in:

- The **Connections** tab of an object's **Properties** dialog box.
- The **Connections** tab of the **Property Panel**.
- The **Expression** box in the **Animation** dialog box.
- Anywhere that you can insert an embedded variable. For information about embedded variables, see Use embedded variables on page 493.

To create a tag placeholder

- Type the cross-hatch character followed by a number (no space in between). For example, #1.

Perform basic operations on objects

Once you have drawn an object, you can select the object and work with it. You can:

- Move objects
- Copy objects
- Duplicate objects
- Resize objects
- Reshape drawing objects
- Delete objects

Move objects

You can move objects using the mouse or the keyboard. The keys give you fine positioning, allowing you to move objects in small increments. You can also use the grid to position objects precisely.

Another option is to position an object using the object's Top and Left properties in the **Property Panel**. For information about using the **Property Panel**, see Use the Property Panel on page 360.

You can also specify an object's position using the **Common** tab in the object's **Properties** dialog box. For more information, see Set up objects' spatial properties, names, and visibility on page 389.

Once you have moved objects into position, you might want to align other objects with them, or lock them into place.

For information about aligning objects, see Align objects on page 382.

For information about locking objects into position, see Lock objects into position on page 387.

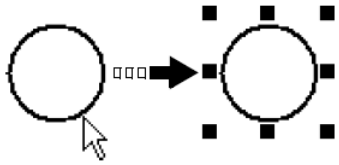
To automatically align objects to the grid as you move them

- From the **View** menu, select **Snap On**. A check mark appears beside the menu item when the option is selected.

For information about setting up the grid, see Use the grid on page 306.

To move objects by dragging with the mouse

1. Select one or more objects.
2. Place the pointer on an object (not on the edge or on the handles).
3. Drag the objects to the desired position.



Select the object. Drag the object to the desired position.

4. If you selected several objects, dragging one of the objects moves all the selected objects. The objects maintain their position relative to each other.

To move objects in small increments using the keyboard

1. Select one or more objects.
2. Place the pointer on the object, not on its edge or handle.
3. Hold down **Shift** while you press an arrow key.

   To adjust the amount of the increment, first hold down the Shift key and press the + or - keys on the keyboard's numeric keypad.

4. Release the **Shift** key when the object is in place.

Copy objects

To copy objects, you can:

- Drag and drop objects in the same display.
- Drag and drop objects between displays, or from a graphic library to a display.

- Copy and paste objects.

When an object is copied, any animation attached to the object is also copied. If a group is copied, the new copy of the group can be ungrouped to individual objects, just like the original.

Copy objects with multiple languages

If an object has multiple language strings set up, copying the object copies all the languages. You have two options for pasting an object with multiple language strings into an application:

- If you use the **Paste** command, the object is pasted into an application with different languages, only the strings for languages that are used by the application are pasted. If the new application has languages that are not set up for the object, those language strings are undefined and will be shown with single question marks.
- If you use the **Paste without localized strings** command, the object is pasted with only the current localized language. The **Paste without localized strings** command removes all other language strings from the object and sets the language strings to Undefined.

For more information about setting up multiple languages, see Set up language switching on page 197.

To copy objects in the same display

1. Select one or more objects.
2. Drag the object, and then press **Ctrl**.

   When you press **Ctrl**, a plus sign is added to the cursor.
3. When the object is where you want it, release the mouse button and then the **Ctrl** key.

   A new copy of the object is created.

   If you selected several objects, dragging one of the objects copies all the selected objects. The objects maintain their position relative to each other.

To drag objects between displays

1. Open both displays (or a graphic library and a display).
2. Position or resize the displays so both are visible.

   For more information, see Resize displays on page 311.

3. Select one or more objects.
4. Click the selected object and drag it to the new display.

   If you selected several objects, dragging one of the objects copies all the selected objects. The objects maintain their position relative to each other.

Copy and paste objects

You can cut, copy, or paste objects using the menu items on the Edit menu or the buttons on the toolbar.

Once you cut or copy an object, you can paste it anywhere in the drawing area of:

- The same graphic display.
- A graphic display in the same or a different application.
- A graphic library in the same or a different application.

To cut or copy objects

1. Select one or more objects.
2. From the **Edit** menu, select **Cut** or **Copy**, or click the Cut tool , or the Copy tool on the **Graphics** toolbar.
   - To remove the original object, click **Cut**.
   - To retain the original object, click **Copy**.

To paste objects

1. Click in the display or library to paste to.
2. From the **Edit** menu, select **Paste**, or click the Paste tool on the **Graphics** toolbar.

Duplicate objects

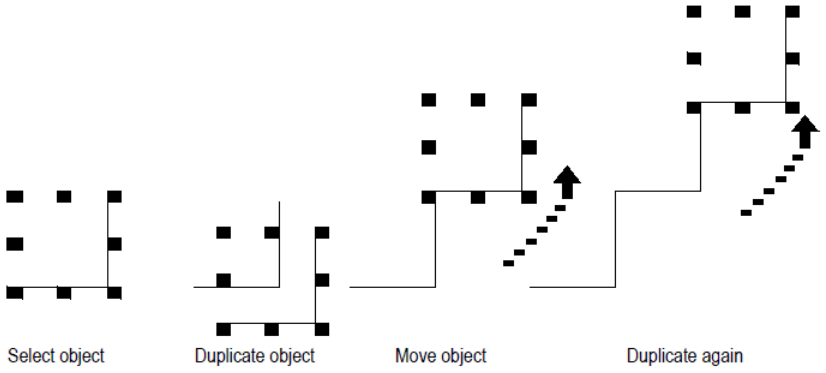
When an object is duplicated, any animation attached to the object is also duplicated. If a group is duplicated, the new copy of the group can be ungrouped to individual objects.

To duplicate objects

1. Select one or more objects.
2. From the **Edit** menu, select **Duplicate**, or click the Duplicate tool on the **Graphics** toolbar.

   The duplicated object is placed slightly offset from the original.

Duplicate also duplicates actions. For example, if you duplicate an object, move it, and then duplicate it again, the second Duplicate will, in one step, duplicate and move the object. This is useful for creating a series of objects with an equal distance between them.



Duplicate works until you deselect the object.

Resize objects

You can resize objects using the mouse or using the keyboard. The keys let you resize objects in small increments. You can also use the grid to resize objects precisely.

Another option is to size an object using the object's Height and Width properties in the **Property Panel**. This method is especially useful for quickly resizing multiple objects to the same size. For information about using the **Property Panel**, see Use the Property Panel on page 360.

You can also specify an object's size using the Common tab in the object's **Properties** dialog box. For more information, see Set up objects' spatial properties, names, and visibility on page 389.

When you resize text objects, if you have selected the Size to fit option, the font size is adjusted to fit the new object size as closely as possible.

To automatically align objects to the grid as you resize them

- From the **View** menu, select **Snap On**. A check mark appears beside the menu item when the option is selected.

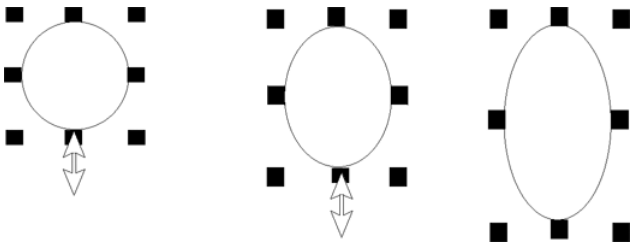
For information about setting up the grid, see Use the grid on page 306.

To resize an object using the mouse

1. Select the object.
2. Place the pointer on one of the handles.

   A double arrow appears.
3. Drag the handle until the object is the desired size or shape.

   Drag a side handle to change width or height, or a corner handle to change both.



For perfect circles and squares, press Ctrl and hold the key down while you drag a corner handle.

To maintain the object's original proportions (width to height), press Shift and hold the key down while you drag a corner handle.

To resize an object in small increments using the keyboard

1. Select the object.
2. Place the pointer on one of the handles.

   A double arrow appears.
3. Hold down **Shift** and press an arrow key until the object is the desired size.

   To adjust the amount of the increment, first hold down the **Shift** key and press the + or - keys on the keyboard's numeric keypad.

Reshape drawing objects

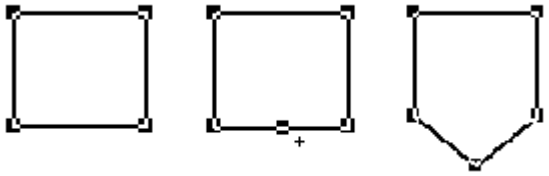
You can reshape arcs, lines, polygons, polylines, rectangles, rounded rectangles, and wedges.

To reshape lines, rectangles, polylines, and polygons

1. Select the object you want to reshape.
2. Click the Polygon tool , or right-click the object and then select **Edit**.

   The cursor changes to the Polygon tool, and handles appear on the object.
3. Move the cursor over any line or corner of the object.

   A handle with a cross-hair appears.
4. Drag the handle until the object is the desired shape.



   Dragging from a point along the line (between corners) creates a new angle between the two corners.
5. To delete an angle, position the pointer at the tip of the angle, and then press Delete.

To reshape arcs and wedges

1. Select the object you want to reshape.
2. Click the Arc tool , or the Wedge tool , or right-click the object and then select **Edit**.

   The cursor changes to the Arc or Wedge tool, and handles appear on the object.
3. Place the pointer on one of the handles.

   A cross-hair appears.
4. Drag the handle until the object is the desired shape.

To reshape rounded rectangles

1. Select the rounded rectangle.
2. Click the Rounded Rectangle tool , or right-click the object and then select **Edit**.

   A handle appears inside the rounded rectangle.
3. Click the handle and drag inward to increase roundedness, or outward to decrease roundedness.

Delete objects

If you accidentally delete an object, use the Undo tool to restore it.

To delete objects

1. Select one or more objects.
2. From the **Edit** menu, select **Delete**, or press **Delete** on the keyboard.

To delete all the objects in the display

- From the **Edit** menu, select **Clear All**.

Work with groups of objects

Group and ungroup objects

Grouping combines several objects into a single object so you can manipulate them as a single object. Grouping is useful for keeping objects in the same position relative to each other. You can cut, copy, and paste groups, arrange the group as a single object relative to other objects, and apply the same properties to all the members of the group at once.

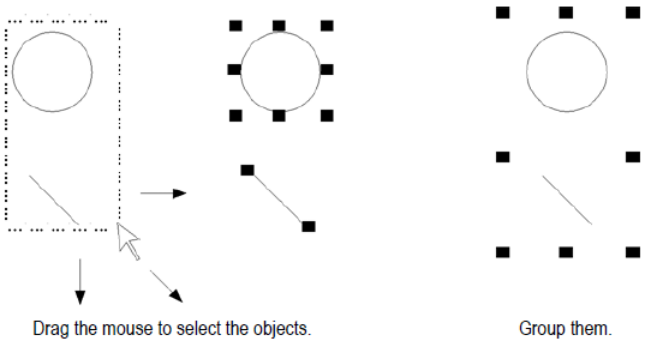
You can attach animation to a group, and any animation attached to individual objects in the group remains active. The group animation generally takes precedence over the animation of individual objects within the group. For more information, see Apply animation to groups on page 471.

Deleting a group deletes all individual objects in the group.

To group objects

1. Select all the objects you want grouped.

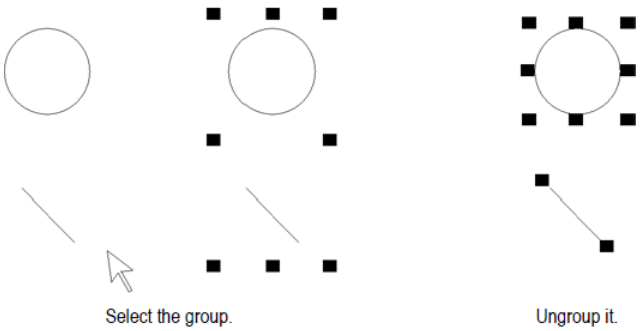
2. From the **Arrange** menu, select **Group**, or on the **Graphics** toolbar, click the Group tool .
3. The handles around each object are replaced by a set of handles around the group.



To ungroup objects

1. Select the group of objects to ungroup.
2. From the **Arrange** menu, select **Ungroup**, or on the **Graphics** toolbar, click the Ungroup tool .

   The handles around the group are replaced with handles around each object.



Ungrouping deletes any animation attached to the group, because the group no longer exists. However, animation attached to the individual objects that were in the group remains active.

Edit groups of objects

Edit a group the same way you would edit an individual object. You can:

- Use the **Property Panel** to apply the same properties to all the members of the group at once. For example, change the line width of all objects in the group to 2 pixels.

  For information about using the **Property Panel**, see Use the Property Panel on page 360.

- Use the toolbars to apply the same pattern style, background style, foreground colors, and background colors to all the members of the group.
- For objects with states, use the States toolbar to cycle through the states and apply the same properties to the states for each object in the group at once. When you select a group containing objects with states, only the states that are common to all objects in the group appear in the toolbar.

  For more information about using the States toolbar, see To open the States toolbar on page 365.

Edit objects within a group

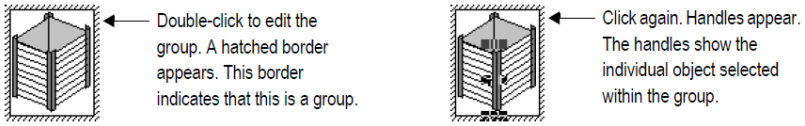
You can also edit individual objects within the group without breaking the group, which is particularly useful when you have animation attached to the group.

To edit objects within a group

1. Double-click the grouped object, or right-click it and then click **Edit**. A hatched border appears around the group.

   When the hatched border is around the group, you are in group edit mode. In this mode, you can select individual objects in the group and modify them.

   You can also add new objects to the group.


Double-click to edit the group. A hatched border appears. This border indicates that this is a group.
Click again. Handles appear. The handles show the individual object selected within the group.

2. To select an individual object (or a group) in the group, click it. You can also use the Object Explorer to select objects within the group.

   The status bar and Object Explorer indicate which object or group is selected.

3. Make your changes to the object.

You can change the selected object's shape, size, or position, or use the object's **Properties** dialog box or the **Property Panel** to edit the object's properties.

4. If desired, create new objects inside the hatched border.
5. To stop editing, click outside the group.

Arrange objects

You can arrange objects (or groups of objects) in a number of ways. You can:

- Layer objects by moving them in front of or behind other objects.
- Align objects with each other and with the grid.
- Space objects horizontally or vertically.
- Flip drawing objects horizontally or vertically.
- Rotate drawing objects.
- Lock objects into position.

Layer objects

You can layer objects (or groups of objects) on top of each other. Objects are layered in the order they are created, with the most recently created object on top. Change the layer order with **Send to Back** and **Bring to Front**.

- **Send to Back** moves the selected object to the bottom layer.
- **Bring to Front** moves the selected object to the top layer.

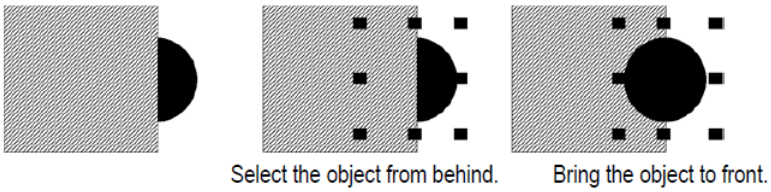
To bring an object to the front

1. Select the object.

   To select an object that's behind another object, place your pointer on the front object, click once, pause, and then click again. Do not double-click and do not move the mouse.

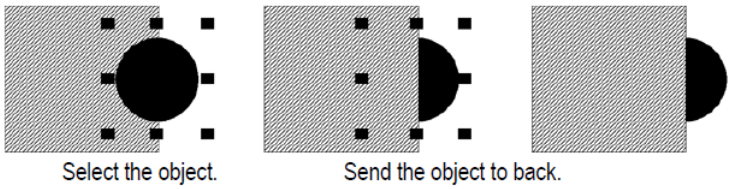
   You can also select a concealed object easily by clicking the object in the Object Explorer.

2. From the **Arrange** menu, select **Bring to Front**, or click the Bring to Front tool .



To send an object to the back

1. Select an object.
2. From the **Arrange** menu, select **Send to Back**, or click the Send to Back tool .



Align objects

You can align objects (or groups of objects) with each other and with the grid.

To align objects

1. Select the objects you want to align.
2. From the **Arrange** menu, select the appropriate menu item, or click a tool on the Alignment toolbar:

This button or menu item	Aligns selected objects with the
Align Left	Left-most selected object
Align Center	Horizontal center of all selected objects
Align Right	Right-most selected object
Align Top	Top-most selected object
Align Middle	Vertical center of all selected objects

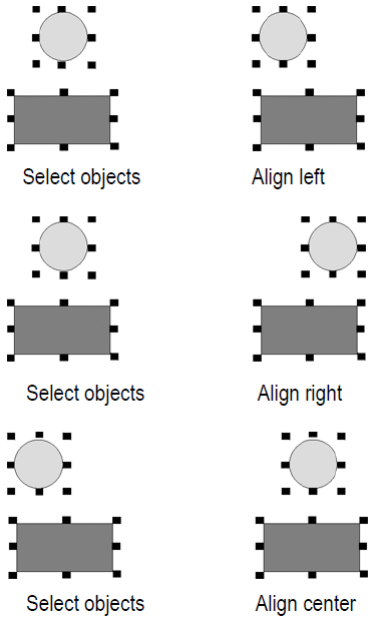
This button or menu item	Aligns selected objects with the
Align Bottom	Bottom-most selected object
Align Center Points	Center of all selected objects
Align to Grid	Grid

To automatically align objects to the grid as you create or move them

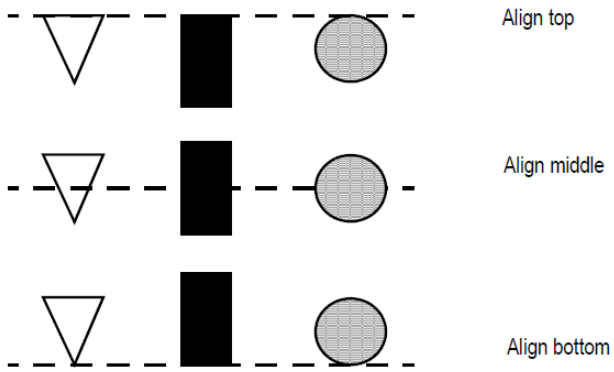
- From the **View** menu, select **Snap On**. A check mark appears beside the menu item when the option is selected.

For information about setting up the grid, see Use the grid on page 306.

Examples: Align objects left, right, and center



Examples: Align objects top, middle, and bottom



Space objects

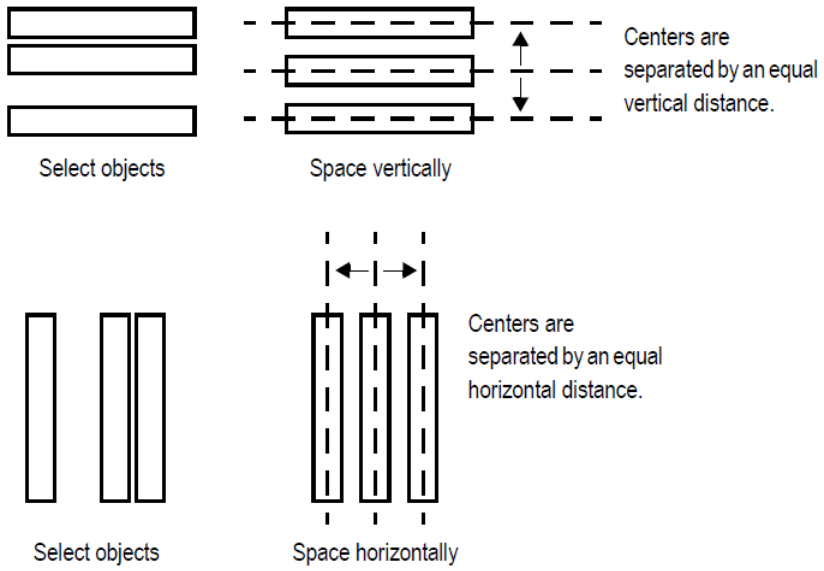
With Space Vertical and Space Horizontal, objects (or groups of objects) are moved vertically or horizontally to have the same amount of space from the center point of each object.

To space objects

1. Select the objects you want to space.
2. From the **Arrange** menu, select a Space menu item, or click a tool on the **Graphics** toolbar:

This tool or menu item	Does this
Space Horizontal	Places the centers of the selected objects an equal distance apart horizontally.
Space Vertical	Places the centers of the selected objects an equal distance apart vertically.

Examples: Space objects vertically and horizontally



Flip drawing objects

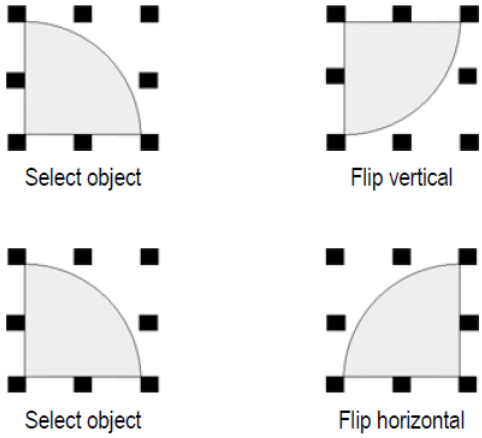
Flipping an object creates a mirror image of the object. You can flip all the drawing objects (or groups of drawing objects) except text, images, and panels.

To flip a drawing object

1. Click the object.
2. From the **Arrange** menu, select a Flip menu item, or click a tool on the **Graphics** toolbar:

This tool or menu item	Flips selected objects
Flip Vertical	Top to bottom (upside-down)
Flip Horizontal	Left to right

Examples: Flip drawing objects vertically and horizontally



Rotate drawing objects

You can rotate all the drawing objects (or groups of drawing objects) except images, panels, and rounded rectangles.

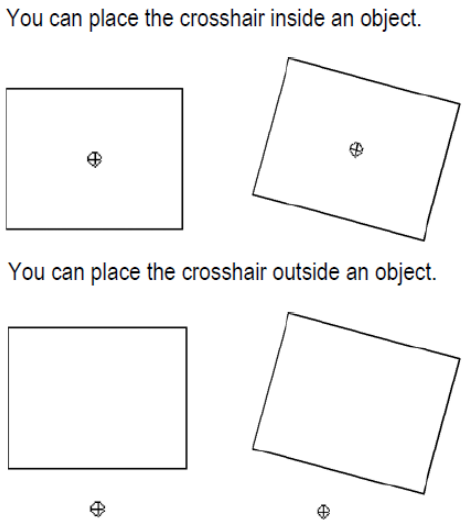
You can attach rotation animation to the same drawing objects. With rotation animation, the object rotates around an anchor point to indicate a tag's value at run time. For details about rotation animation, see Set up rotation animation on page 470.

When you rotate text, it rotates around the anchor point but the text itself remains upright.

To rotate a drawing object

1. From the **Objects** menu, select **Rotate**, or on the Objects toolbar click the Rotate tool .

2. Click the object you want to rotate. A small crosshair circle appears in the middle of the object. This is the anchor point that is used as the center of rotation.



3. To move the center of rotation, click the cross-hair and drag it to a new anchor position. The anchor can be inside or outside the object.

4. Click an edge of the object and drag in the direction you want to rotate it.

   To rotate the object in five-degree increments, press **Ctrl** while you drag.

5. When the object is in the desired position, release the mouse button.

Lock objects into position

You can lock graphic objects (or groups of objects) into position by converting them to wallpaper. Once you convert objects to wallpaper, you cannot select or edit them unless you unlock the wallpaper. Wallpaper objects cannot be animated at run time.

If the grid is on, wallpaper objects are positioned behind the grid. If you just want to lock the objects into place while you're working in the display, unlock the wallpaper when you're finished. If you want to use the wallpaper objects as a background for your display, leave the wallpaper locked. For more information about creating a background for your display, see Create a background for your display on page 312.

Set up graphic objects

This chapter describes how to set up graphic objects. It describes how to:

- Set up objects' spatial properties, names, and visibility
- Work with objects that have states
- Position objects for touch screens
- Assign function keys to buttons
- Use the keyboard to navigate to and select objects at run time
- Link buttons to lists and trends
- Repeat a button's action by holding down the button
- Ensure values are read by the data source before sending new values
- Set up objects

For objects that are not described in other chapters of the manual, this chapter provides information about how to use the objects.

For information about creating graphic objects, see Use graphic objects on page 331.

For information about creating and setting up the trend graphic object, see Set up trends on page 535.

For information about creating and setting up the **RecipePlus** graphic objects, see Set up RecipePlus on page 547.

Set up objects' spatial properties, names, and visibility

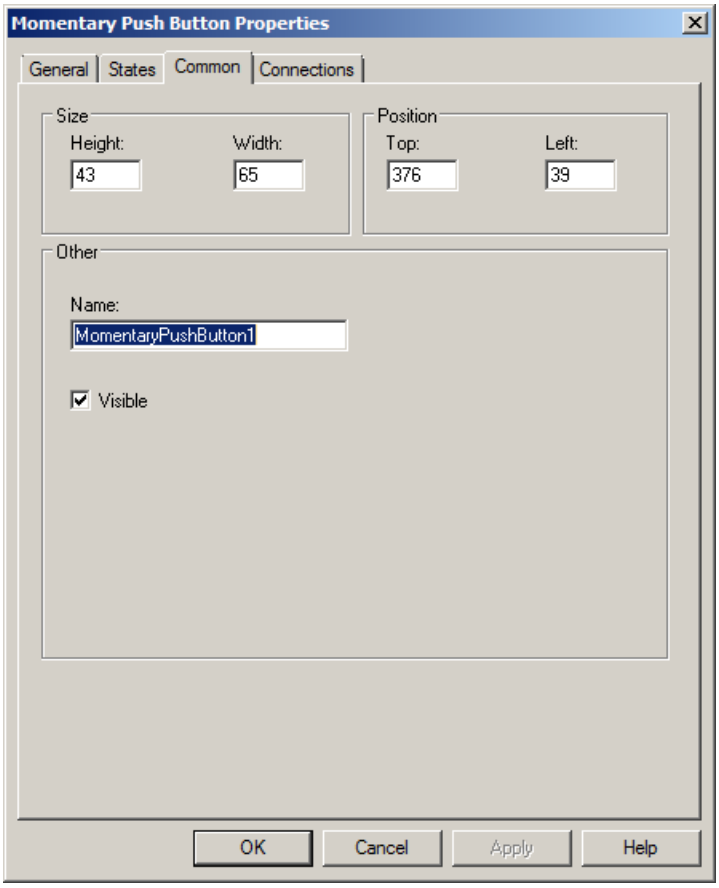
Every graphic object has a Common tab in its **Properties** dialog box. Use the **Common** tab to set up the following properties for the object:

- Height and width
- Top and left position
- Name
- Visibility

For ActiveX and trend objects, you can also set up these properties:

- Focus highlight

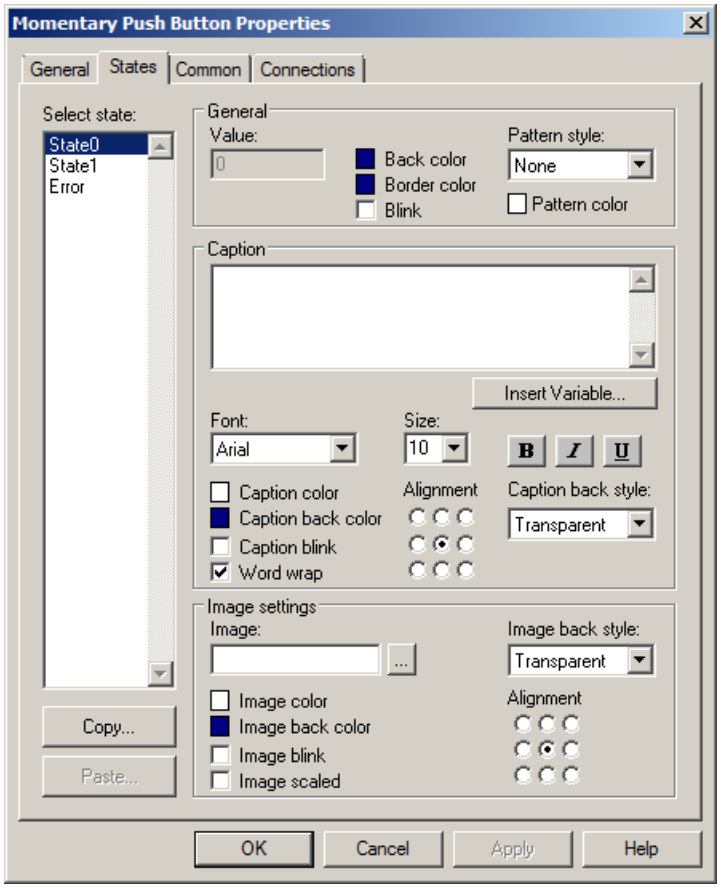
- Key navigation



For details about the options in the **Common** tab, see Help.

Tips for setting up objects with states

The graphic objects that have states have a **States** tab in their **Properties** dialog box.



For details about the options in the **States** tab, see Help.

Copy and paste properties from one state to another

Often, you want most of the properties to be the same from state to state, with only one or two settings changing to distinguish the different states.

To simplify setting up states when many of the properties are the same, you can copy and paste settings from one state to another. For details, see Help.

Add and remove states

Some graphic objects have a configurable number of states. For these objects, you can use the Insert State and Delete State buttons in the States tab, to add and remove states without returning to the **General** tab. The **Number of States** setting on the **General** tab is automatically updated.

For more information about the **Insert State** and **Delete State** buttons, see Help.

Set up how objects are used at run time

Just as you must provide operators with a way to navigate between displays at run time, you must also make sure that operators can use the objects within the displays. The next sections in this chapter describe how to set up your objects so the operator can:

- Press objects using a touch screen.
- Use function keys to press buttons when a mouse or touch screen is not available on the runtime computer.
- Use the keyboard or keypad to navigate to and select lists, trends, and ActiveX input objects.
- Use buttons to work with lists and trends.
- Repeat a button's action by pressing and holding it.
- Ensure that tag values are read by the data source before sending new values.

Position objects for touch screens

If the operator will be using a touch screen at run time, keep these tips in mind when positioning graphic objects in your displays:

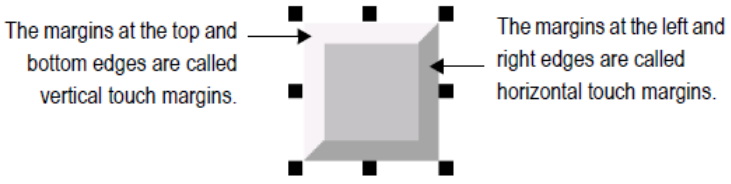
- Don't place important buttons where they'll be blocked by an On Top display. The user can't press a covered button.
- Ensure buttons are large enough for users to touch easily.
- Use touch margins for buttons that are positioned close together, to ensure that the adjacent button is not pressed by mistake.

Use touch margins

Touch margins are touch-insensitive borders inside the button's margin. If the operator presses on the touch margin, the button press is not registered. Touch margins are useful when buttons are positioned close to each other and you want to make sure the operator does not press the wrong button by mistake.

You can create touch margins at the top and bottom of the button, at the sides, or on all four sides.

In the illustration below, the button's border and touch margins are the same size, 12 pixels. A button press would be registered only when the darker square in the middle of the button is pressed.


The margins at the top and bottom edges are called vertical touch margins.
The margins at the left and right edges are called horizontal touch margins.

The bounding box

If the object's shape is a circle or ellipse, the touch margin applies to the object's bounding box, not the object's border. The bounding box is an invisible square or rectangle that surrounds the object. When you select the object, the selection handles show the location of the bounding box.

To create touch margins, use one of these methods

- In the **General** tab of the button's **Properties** dialog box, type the number of pixels for the touch margins in the **Horizontal margin** and **Vertical margin** boxes.
- In the **Properties** tab of the **Property Panel**, type the number of pixels for the **HorizontalMargin** and **VerticalMargin** properties.

Assign function keys to buttons

You can assign function keys to the buttons in your displays to allow the operator to press the buttons using the function keys on the runtime terminal (or the function keys on a keyboard, if one is available). You can also assign a function key to the numeric input cursor point.

You can assign up to 34 function keys to each graphic display.

Here are some tips for assigning function keys:

- Where possible, use the same function keys for the same operations in all your graphic displays. For example, if every display contains a Goto display button that returns the operator to a graphic display called Main Menu, assign the same function key to this button in each display.
- Include the name of the function key assigned to a button in a caption on the button.

  For buttons with multiple states, include the function key name in the caption for each state, or create a text object to use as a label for the button (so that you don't have to set up the caption for each state), and then group the text and button together.
- If your application will run on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, assign keys that are supported by the runtime terminal. Different sizes of terminals have different function keys.

Function key equivalents

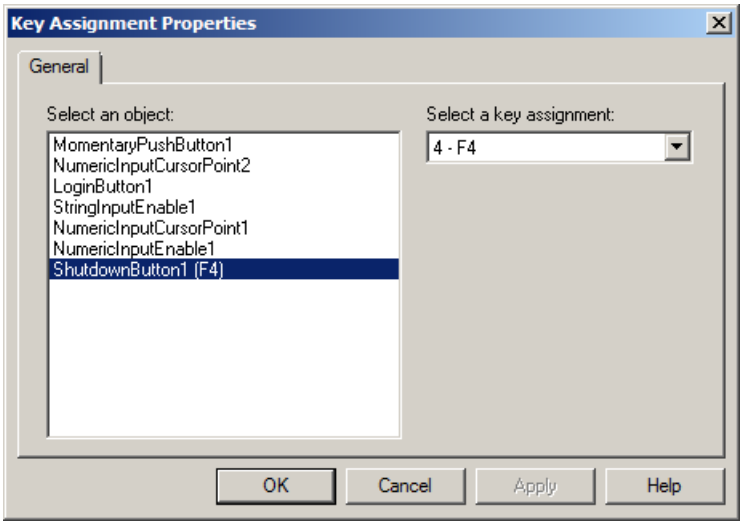
If your application will run on a personal computer, the keyboard contains the function keys F1 to F12 only. The remaining function keys are associated with these key combinations:

For this function key	Use this key combination
F13	Left **Shift+F1**
F14	Left **Shift+F2**
F15	Left **Shift+F3**
F16	Left **Shift+F4**
F17	Left **Shift+F5**
F18	Left **Shift+F6**
F19	Left **Shift+F7**
F20	Left **Shift+F8**
K1 - K12	Right **Alt+F1** - right **Alt+F12**
K13	Right **Shift+F1**
K14	Right **Shift+F2**
K15	Right **Shift+F3**
K16	Right **Shift+F4**
K17	Right **Shift+F5**
K18	Right **Shift+F6**
K19	Right **Shift+F7**
K20	Right **Shift+F8**

At run time, the operator presses the key combination to activate the object to which the function key is assigned.

To assign function keys to buttons

- From the **Edit** menu, select **Key Assignments**, or right-click a button and then select **Key Assignments.**



For details about using the **Key Assignment Properties** dialog box to assign function keys and change function key assignments, see Help.

Use the keyboard to navigate to and select objects

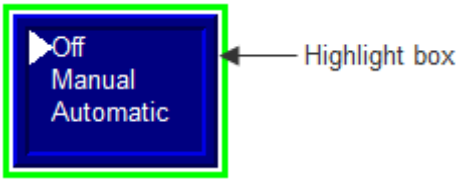
If a mouse or touch screen is not available on the runtime computer, the operator can use the keys on a keyboard or keypad to select (give focus to) these objects:

- Lists: control list selector, piloted control list selector, display list selector, diagnostics list, alarm list, and alarm status list
- Alarm banners
- Trends
- Numeric input enable buttons and String Input Enable buttons
- Numeric input cursor points
- RecipePlus table and selector
- Third-party ActiveX input objects

What input focus looks like

The object with focus is surrounded by a highlight box, unless the Disable Highlight When Object has Focus box is selected (in the **Display Settings** dialog box). You can specify the color of the highlight in this dialog box as well.

For more information, see Help.



Focus highlight for ActiveX and trend objects

For ActiveX and trend objects, use the Common tab in the object's **Properties** dialog box to specify whether or not to show a highlight box. For more information about setting up options on the **Common** tab, see Set up objects' spatial properties, names, and visibility on page 389.

If the **Disable Highlight When Object has Focus** check box is selected in the **Display Settings** dialog box, that setting overrides the setting you specify in the **Common** tab.

Use the keys on the keyboard or keypad

When a graphic display opens, the keyboard-navigable object that is closest to the top left corner of the display is selected. The operator can use these keys to move to and select a different object:

Use this key	To do this
Tab	Move from the upper left to the lower right.
Shift+Tab	Move from the lower right to the upper left.
Ctrl+arrow key	Move left, right, up, or down.

Remove objects from and adding objects to the tab sequence

By default, you can use the keys to navigate to all lists, alarm banners, numeric input cursor points, trends, and ActiveX input objects in a display. However, you can turn off key navigation for these objects if desired.

When an object's key navigation is turned off, the operator can still select the object using a mouse or touch screen, if available.

By default, key navigation is turned off for the Numeric Input Enable buttons and **String Input Enable** buttons. You can turn on keyboard navigation if you want the operator to use the keyboard to navigate to these objects.

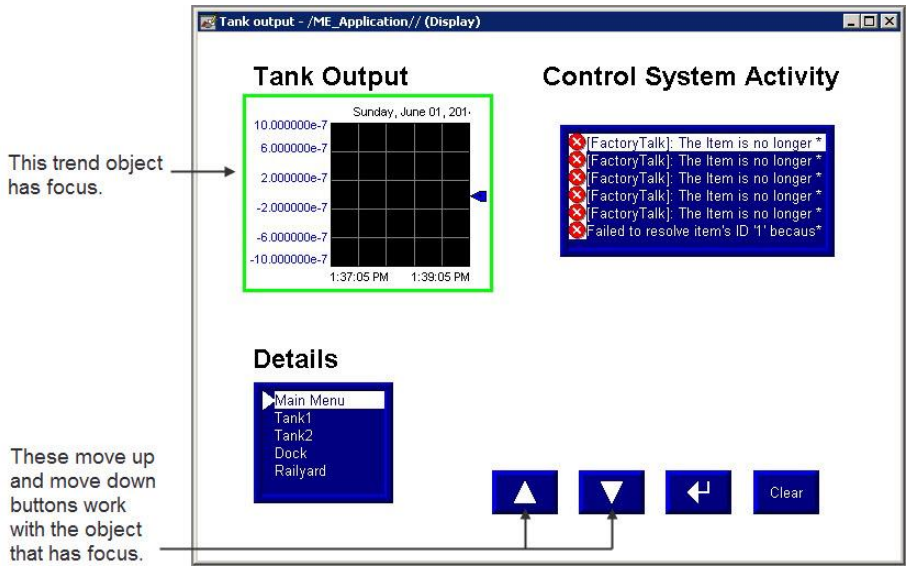
To turn key navigation on or off, use one of these methods

- In the **Properties** tab of the **Property Panel**, set the **KeyNavigation** property to **False** for off, or **True** for on.
- For list objects, alarm banners, numeric input cursor points, **Numeric Input Enable** buttons, and **String Input Enable** buttons, in the **General** tab of the object's **Properties** dialog box, clear the **Key navigation** box for off, or select the box for on.
- For ActiveX and trend objects, in the **Common** tab of the object's **Properties** dialog box, clear the **Key** navigation box for off, or select the box for on.

Link buttons to objects

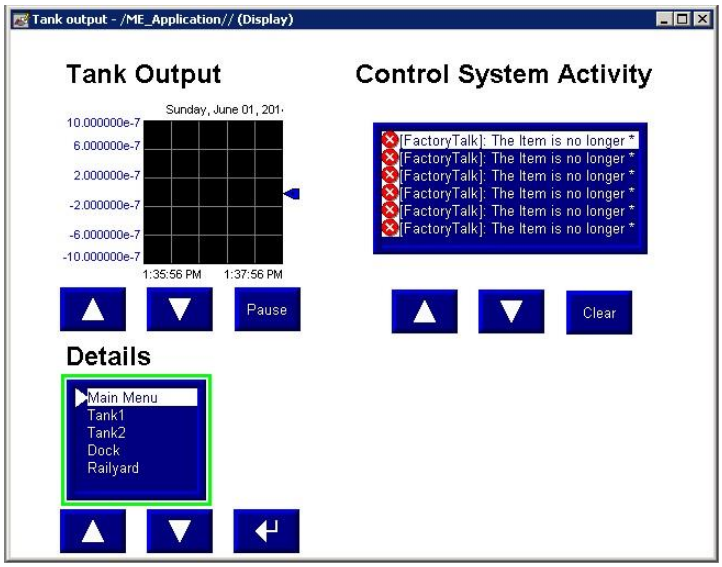
Some FactoryTalk View buttons can be linked to specific trend, list, recipe, and alarm banner objects, or you can set them up to work with whichever object has focus in the display.

If you are creating small graphic displays, you might prefer to use one set of buttons to work with all the display's graphic objects that accept input focus.



By default, the buttons are set up to work with whichever object has input focus (is selected) in the display.

However, if space is not a concern, you can create multiple copies of the buttons you want to use and link them to specific objects. One benefit of linking a button to a specific object is that the operator does not have to select the object before pressing the button. Another benefit is that you can position the buttons close to the specified object, making it easier for the operator to understand which buttons work with which objects.



To link a button to a specific object using the button's Properties dialog box

1. Double-click the button to open its **Properties** dialog box.
2. In the **General** tab, in the **Send press to** box, select **Linked Object**.
3. To select from a list of all the objects in the display that you can link the button to, click the Browse button next to the Linked object box.
4. Click the name of the object to link the button to, and then click **OK**.
5. Click **OK** to close the button's **Properties** dialog box.

To link a button to a specific object using the Property Panel

- In the **Properties** tab, specify the **SendPressTo** and **LinkedObject** properties.

Once you have linked buttons to an object, you might want to turn off the object's key navigation, since this option is no longer needed. For details, see To turn key navigation on or off, use one of these methods on page 397.

Repeat a button's action by holding down the button

To repeat a button's action by pressing and holding it, set up auto repeat for the button. If you set up auto repeat, when the operator presses and holds down the button, repeated button presses are registered until the operator releases the button.

A button press occurs when the operator clicks an object with the mouse, presses it on a touch screen, or presses the function key associated with the object. Auto repeat works with all these methods of pressing buttons.

You can use auto repeat with these buttons:

For this button	Each button press does this
Multistate push	Sends the value for the next state to the data source. External changes to the **Value** connection are not recognized when the button is in auto repeat mode.
Ramp	Sends the new ramped value to the data source. External changes to the **Value** connection are not recognized when the button is in auto repeat mode.
Move up	Moves the highlight up an item in the list, recipe selector, or recipe table, scrolls up in the trend, or ramps the numeric input cursor point or Numeric Input Enable button value.
Move down	Moves the highlight down an item in the list, recipe selector, or recipe table, scrolls down in the trend, or ramps the numeric input cursor point or Numeric Input Enable button value.
Page up	Moves the highlight up a page in the list, recipe selector, or recipe table.
Page down	Moves the highlight down a page in the list, recipe selector, or recipe table.
Move left	Scrolls the trend to the left.
Move right	Scrolls the trend to the right.

For each button that uses auto repeat, you can specify these properties:

- **Auto repeat rate** — the number of times per second a button press is registered when the button goes into auto repeat mode. The default rate is 0, which means that auto repeat is turned off.
- **Auto repeat delay** — the length of time the button has to be pressed and held down before auto repeat starts.

To set up auto repeat for a button, use one of these methods

- In the **Timing** tab of the button's **Properties** dialog box, specify the **Auto repeat rate** and **Auto repeat delay** properties.
- In the **Properties** tab of the **Property Panel**, specify the **AutoRepeatRate** and **AutoRepeatDelay** properties.

Ensure values are read by the data source before sending new values

To ensure a value is read by the data source before the operator sends a new value, use **Enter key handshaking**. While **Enter key handshaking** is in effect for an object, the operator cannot send a new value to the object's **Value** connection.

You can use **Enter key handshaking** with these graphic objects:

- **Control list selector**
- **Piloted control list selector**
- **Numeric input enable button**
- **String Input Enable button**
- **Numeric input cursor point**

If **Enter key handshaking** is in effect for one of these objects, the operator can still provide input to other objects in the graphic display.

If the graphic display is closed while **Enter key handshaking** is in effect, the handshaking is canceled.

Methods of Enter key handshaking

Enter key handshaking works by setting the object's **Enter** connection to 1. As long as the **Enter** connection is set to 1, new values cannot be sent to the **Value** connection. How the **Enter** connection is reset to 0 depends on how you set up **Enter key handshaking**.

There are two ways you can use **Enter key handshaking**:

- To hold the value at the data source for a specific period of time.
- To hold the value at the data source until the data source notifies FactoryTalk View that the value has been read.

Choose the method that best suits your application needs and communication system.

Hold the value for a specific period of time

To set up an object's **Enter key handshaking** so that the value at the **Value** connection is held for a specific period of time, assign a tag to the **Enter** connection and specify the **Enter** key hold time. You can also specify an **Enter** key control delay, if desired.

How handshaking works

This method of **Enter key handshaking** works as follows:

1. When the operator presses the **Enter** button, the value is sent to the **Value** connection and the **Enter key control delay** timer begins timing. (The use of a delay is optional.)

2. If you specify an **Enter** key control delay, when the time is up, the **Enter** connection is set to 1. If you don't use the delay, the **Enter** connection is set to 1 as soon as the operator presses **Enter**.

   As long as the **Enter** connection is set to 1, the operator cannot send new values to the data source.

3. When the **Enter** connection is set to 1, the **Enter key hold time** timer begins timing.

4. When the **Enter** key hold time has expired, the **Enter** connection is reset to 0 and the operator can send a new value to the **Value** connection.

To set up Enter key handshaking to hold the value for a specific period of time

1. In **Timing** tab of the object's **Properties** dialog box, specify the **Enter key control dela**y (optional) and **Enter key hold time** properties.

2. In the **Connections** tab, assign a tag to the **Enter** connection. A digital tag is recommended (either an HMI tag or a data server tag).

You can also use the **Property Panel** to specify the properties and assign a tag to the **Enter** connection.

Hold the value until it is acknowledged

To set up an object's **Enter key handshaking** so that the value at the **Value** connection is held until the data source notifies FactoryTalk View that it has read the value, use two connections: the **Enter** connection and the **Enter handshake** connection.

Instead of using an **Enter key hold time**, specify an **Enter key handshake time**. You must also specify the Handshake reset type. You can use an **Enter key control delay**, if desired.

How the Handshake reset type works

How the **Enter handshake** connection resets the **Enter** connection depends on which **Handshake reset type** you select:

With this handshake reset type	The Enter connection is set to 0 when
Non-zero Value	The **Enter handshake** connection has a non-zero value. If the **Enter handshake** connection already has a non-zero value when the value is sent to the **Value** connection (or when the **Enter** key control delay has expired, if the delay is used), then the **Enter** connection is not set to 1, and **Enter key handshaking** does not take place.
Zero to Non-zero transition	The **Enter handshake** connection changes from 0 to a non-zero value.

Set up the data source to send a non-zero value to the **Enter handshake** connection when it has read the new value at the **Value** connection, and then to reset the **Enter handshake** connection to 0.

If the **Enter key handshake time** expires before the **Enter handshake** connection resets the **Enter** connection, an error message is sent to FactoryTalk Diagnostics.

How handshaking works

If you use the **Enter handshake** connection, handshaking works like this:

1. When the operator presses the **Enter** button, the value is sent to the **Value** connection and the **Enter key control delay** timer begins timing. (The use of a delay is optional.)

2. If you specify an Enter key control delay, when the time is up, the **Enter** connection is set to 1. If you don't use the delay, the **Enter** connection is set to 1 as soon as the operator presses **Enter**.

   As long as the **Enter** connection is set to 1, the operator cannot send new values to the data source.

   If the Handshake reset type is Non-zero Value, the **Enter handshake** connection must be 0 when the delay expires in order to set the **Enter** connection to 1.

3. When the **Enter** connection is set to 1, the **Enter key handshake time** timer begins timing.

4. The **Enter** connection remains set until the **Enter key handshake time** expires or until reset by the **Enter handshake** connection, whichever happens first.

5. The **Enter** connection is reset to 0 and the operator can send a new value to the **Value** connection.

To set up Enter key handshaking to hold the value until the data source has read it

1. In the **Timing** tab of the object's **Properties** dialog box, specify these properties:
   - **Enter key control delay (optional)**
   - **Enter key handshake time**
   - **Handshake reset type**
2. In the **Connections** tab, assign these connections:
   - **Enter** — assign a tag. A digital tag is recommended (either an HMI tag or a data server tag).
   - **Enter handshake** — assign a tag or expression.
3. Set up the data source to send a non-zero value to the **Enter handshake** connection when it has read the new value at the **Value** connection, and then to reset the **Enter handshake** connection to 0.

You can also use the **Property Panel** to specify the properties and assign tags to the connections.

Time, date, and number formats for graphic objects

Graphic objects use the time, date, and number format of the current application language. For example, if the application language uses a comma for the decimal symbol, floating-point values shown in graphic objects uses a comma for the decimal symbol.

For information about using multiple languages, see Set up language switching on page 197.

Set up buttons

Many of the button graphic objects are set up the same way. The instructions in this section apply to the following buttons:

- Alarm status mode
- Backspace
- Clear alarm banner
- Clear alarm history
- Diagnostics clear
- Diagnostics clear all
- Display print
- End
- Enter
- Goto configure mode

- Home
- Information acknowledge
- Language Switch
- Login
- Logout
- Move down
- Move left
- Move right
- Move up
- Next pen
- Page down
- Page up
- Password
- Pause
- RecipePlus
- Reset alarm status
- Return to display
- Shutdown
- Silence alarms
- Sort alarms

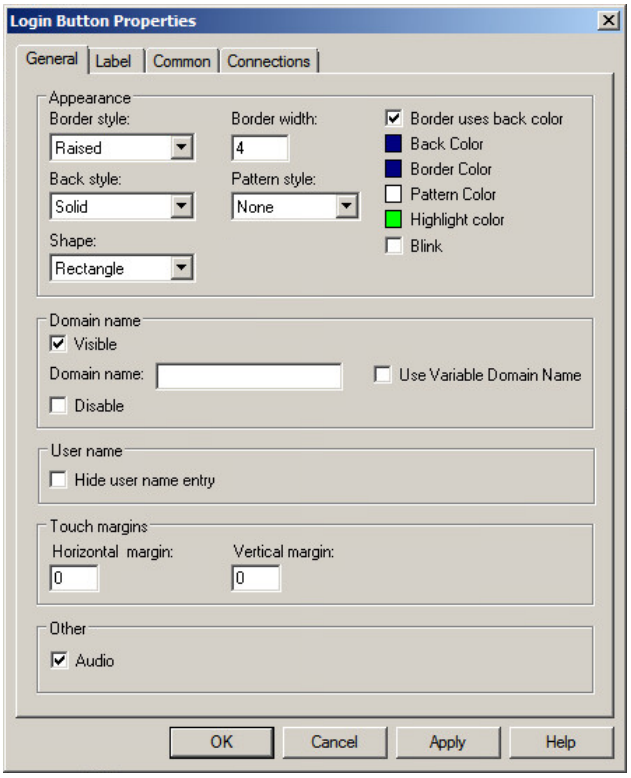
You can set up any combination of these buttons in a graphic display. For example, you might want to put a login, logout, and shutdown button in the same graphic display.

Create and then set up each button separately.

The illustration shows the login button. Some buttons have different properties on the General tab, but you can use these instructions to set up any of the buttons in the list. For example, on the General tab for the acknowledge all alarms button and the clear alarm history button, you can specify a subset of alarms to which the button's action applies. For details about filtering alarm triggers, see Filter alarm triggers in multiple languages on page 123.

To set up a button

1. Double-click the button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the button looks like at run time. For some buttons, you can specify whether to link the button to a specific object. For the logout button, you can specify a display to open when the button is pressed, and whether the display will use a parameter file or list when it opens.
   - In the **Label** tab, specify what text or image to show on the button.
   - In the **Timing** tab, set up whether or not the button press repeats automatically when the operator presses and holds the button down. You can also set up the rate at which the button press repeats. For more information about auto repeat, see To set up auto repeat for a button, use one of these methods on page 399.
   - In the **Common** tab, specify the button's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Buttons described later in the chapter

Information about setting up the following buttons is described later in the chapter:

- Close display
- Goto display
- Interlocked push
- Latched push
- Macro
- Maintained push
- Momentary push
- Multistate push
- Numeric input enable
- Print alarm history
- Print alarm status
- Ramp
- String Input Enable

How to use push buttons

Push buttons start or stop processes or actions by changing tag values.

Important:	Never use push buttons for emergency stops. Emergency stop buttons must always be hard-wired.

You can use different kinds of push buttons, depending on what kind of machinery you are running or process you are controlling:

- **Momentary push buttons** change a tag to one value when the button is pressed, and another value when the button is released. The machine is on only while the button is held down. When the button is released, the machine turns off. Momentary push buttons are useful for jogging a motor, and they can be set up to start and stop a machine or process.
- **Maintained push buttons** toggle between two values. This type of button is useful for changing a setting within a machine or process, but not for starting the machine or process. For example, use the Maintained push button for changing modes, such as Auto to Manual, or Metric to Imperial.
- **Latched push buttons** latch in the on position, and must be unlatched by another button or process to return to the off position. This type of button is useful for starting a machine or process.

- **Multistate push buttons** allow an operator to cycle through multiple options consecutively, using a single button. The current state of a process or operation is shown on the button by a different color, caption, or image for each state.
- **Interlocked push buttons** work in groups, and share the same tag. Pressing one button cancels another. Although Interlocked push buttons work as a group, you add them to the display one at a time.
- **Ramp buttons** increase or decrease the value of a tag by either an integer or floating-point value. You can use two Ramp buttons together to create an increment/decrement control, for example for the speed of a motor. Or, you can use a Numeric Input Enable button or numeric input cursor point.

For information about the **Numeric Input Enable** button, see Set up Numeric Input Enable buttons on page 418.

For information about the numeric input cursor point, see Set up numeric input cursor points on page 420.

Set up Momentary push buttons

Use the Momentary push button to start a process or action. When pressed, the button changes a tag to one value, and when released, the button changes the tag to another value.

The Momentary push button's states can perform one of three kinds of actions:

- Change the **Value** connection to 1 when the button is pressed, and to 0 when the button is released. This kind of button is called **normally open**, because its released state is off. Pressing the button completes the circuit.
- Change the **Value** connection to 0 when the button is pressed, and to 1 when the button is released. This kind of button is called **normally closed**, because its released state is on. Pressing the button breaks the circuit.
- Change the **Value** connection to a value you specify. You assign the desired values to the button's press and release actions. For example, 50 when pressed, and 100 when released.

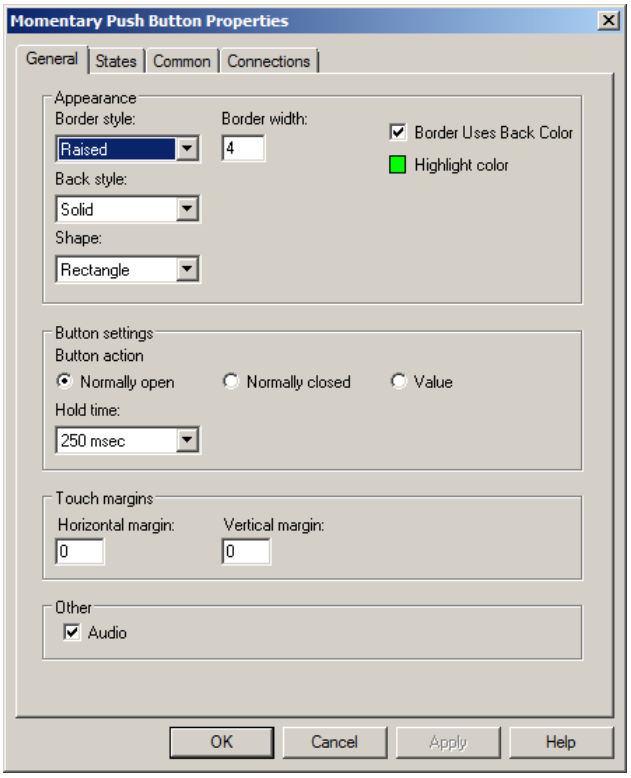
The error state

The button's error state is shown at run time when:

- The **Value** connection is unassigned.
- The **Indicator** connection value does not match one of the state values you set up.

To set up a Momentary push button

1. Double-click the **Momentary** push button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the button looks like at run time, and what type of action the button performs.
   - In the **States** tab, specify what the button looks like when it is pressed and released at run time. For tips about setting up states, see Tips for setting up objects with states on page 390.
   - In the **Common** tab, specify the button's spacial properties, name, and visibility.
   - In the **Connections** tab, specify the tags or expression with which the button exchanges data. For information, see Assign tags and expressions to graphic objects on page 366.

3. For details about the options in the tabs, see Help.

4. When you are finished, click **OK**.

Set up Maintained push buttons

Use the **Maintained** push button to change a setting in a machine or process. Maintained push buttons are not useful for starting or stopping a machine or process.

When pressed the first time, the Maintained push button changes a tag to one value. When pressed and released a second time, the button changes the tag to another value.

The error state

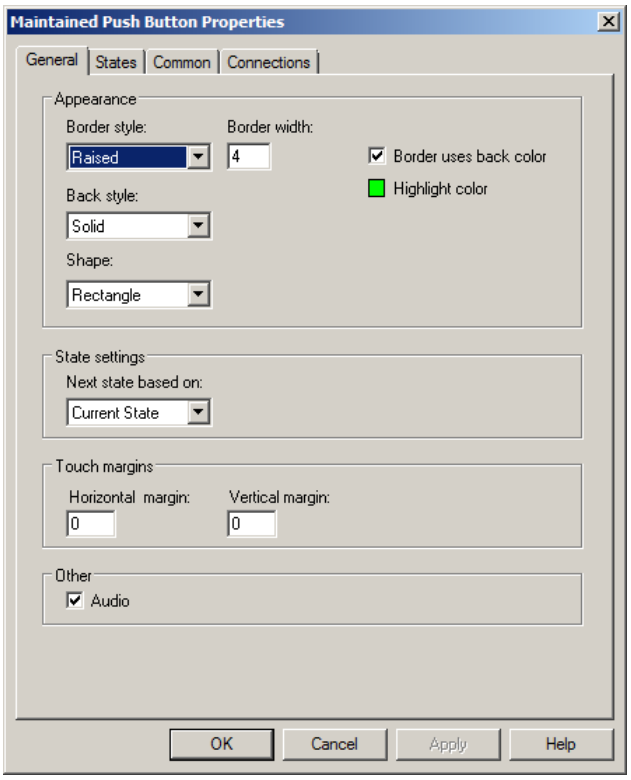
The button's error state is shown at run time when:

- The **Value** connection is unassigned.
- The **Indicator** connection value does not match one of the state values you set up.

The error state is also shown when the display containing the Maintained push button first opens, if the **Value** connection value does not match one of the state values you set up.

To set up a Maintained push button

1. Double-click the Maintained push button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the button looks like at run time, and how the button changes state.
- In the **States** tab, specify what the button looks like when it is pressed and released at run time. For tips about setting up states, see Tips for setting up objects with states on page 390.
- In the **Common** tab, specify the button's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tags or expression with which the button exchanges data. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up Latched push buttons

The Latched push button latches in the On position, and must be unlatched by another button or process to return to the Off position. This type of button is useful for starting a machine or process.

For example, use the Latched push button when you want the **Value** connection to start a process within a programmable controller and remain set until the process is completed. You can also use a Latched push button when you have a controller with a long program or long update times.

When the operator presses a Latched push button, it changes the **Value** connection to one value, and remains at that value until the **Handshake** connection gives the signal to unlatch the button.

The error state

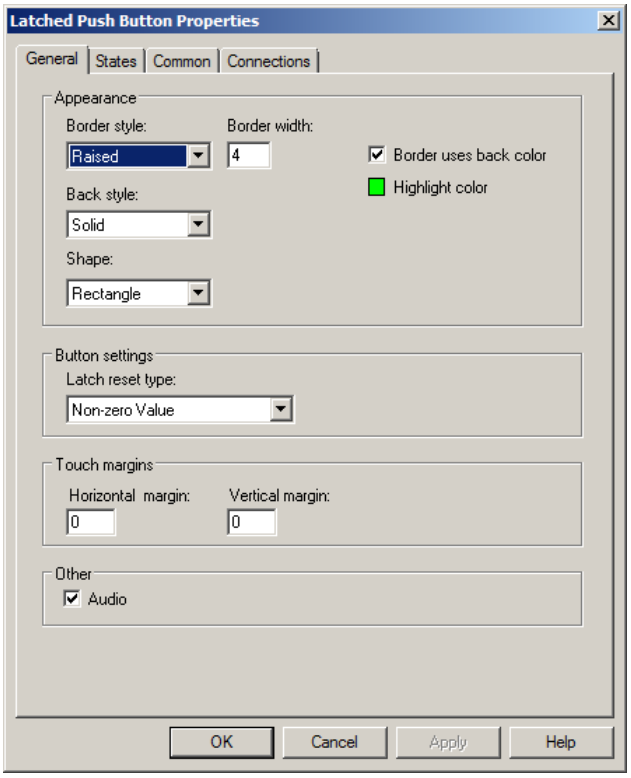
The button's error state is shown at run time when:

- The **Value** connection is unassigned.
- The **Indicator** connection value does not match one of the state values you set up.
- The **Handshake** connection is unassigned.

The error state is also shown when the display containing the Latched push button first opens, if the **Value** connection value does not match one of the state values you set up.

To set up a Latched push button

1. Double-click the **Latched** push button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the button looks like at run time, and how to unlatch it.
   - In the **States** tab, specify what the button does when it is latched and unlatched. For tips about setting up states, see Tips for setting up objects with states on page 390.
   - In the **Common** tab, specify the button's spacial properties, name, and visibility.
   - In the **Connections** tab, specify the tags or expression with which the button exchanges data. For information, see Assign tags and expressions to graphic objects on page 366.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up Multistate push buttons

The **Multistate** push button displays and allows an operator to cycle through multiple options consecutively. The **Multistate** push button displays the current state of a process or operation by showing a different color, caption, or image to reflect different states.

Each time the operator presses the button, the tag changes to the value for the next state. When the button is in its last state and the operator presses the button, the button returns to its first state.

The error state

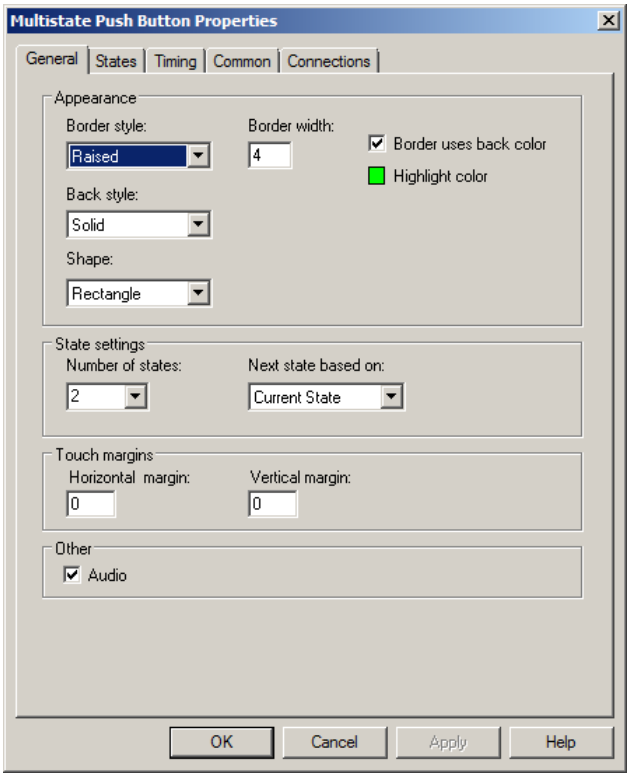
The button's error state is shown at run time when:

- The **Value** connection is unassigned.
- The **Indicator** connection value does not match one of the state values you set up.

The error state is also shown when the display containing the Multistate push button first opens, if the **Value** connection value does not match one of the state values you set up.

To set up a Multistate push button

1. Double-click the Multistate push button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the button looks like at run time, and how the button changes state.
   - In the **States** tab, specify what the button does when it is pressed and released. For tips about setting up states, see Tips for setting up objects with states on page 390.
   - In the **Timing** tab, set up whether or not the button press repeats automatically when the operator presses and holds the button down. You can also set up the rate at which the button press repeats. For more information about auto repeat, see Repeat a button's action by holding down the button on page 399.
   - In the **Common** tab, specify the button's spacial properties, name, and visibility.
   - In the **Connections** tab, specify the tags or expression with which the button exchanges data. For information, see Assign tags and expressions to graphic objects on page 366.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up Interlocked push buttons

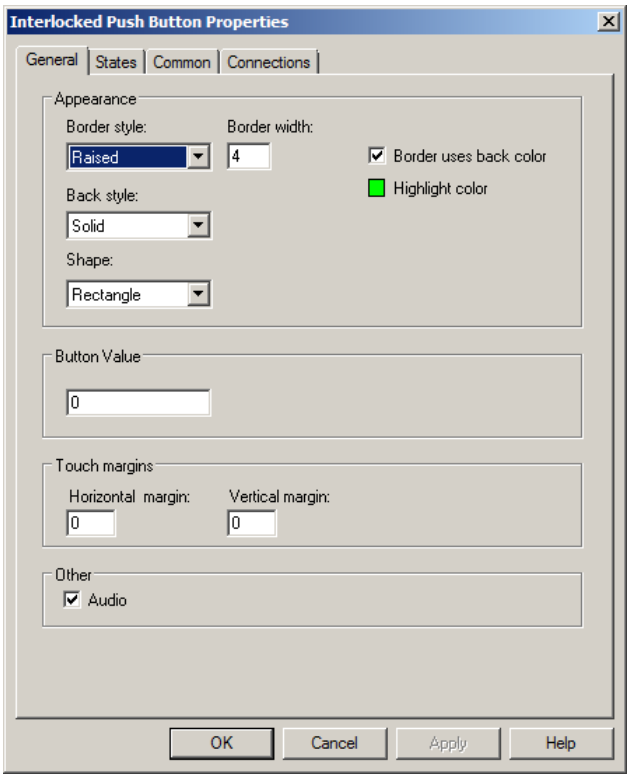
Multiple Interlocked push buttons work together and share the same tag. Pressing one button cancels another. Although Interlocked push buttons work as a group, you add them to the display one at a time.

When the operator presses one of the Interlocked push buttons, the tag assigned to its **Value** connection changes to one value. When the operator presses a different Interlocked push button, the tag changes to another value. Assign the same tag to each button's **Value** connection.

You can also use a single Interlocked push button to send a value to a tag.

To set up an Interlocked push button

1. Double-click the Interlocked push button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the button looks like at run time, and the value it sends to the **Value** connection.
- In the **States** tab, specify what the button looks like when it is pressed and released at run time. For tips about setting up states, see Tips for setting up objects with states on page 390.
- In the **Common** tab, specify the button's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tag with which the button exchanges data. **Interlocked** push buttons have no **Indicator** connection. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up Ramp buttons

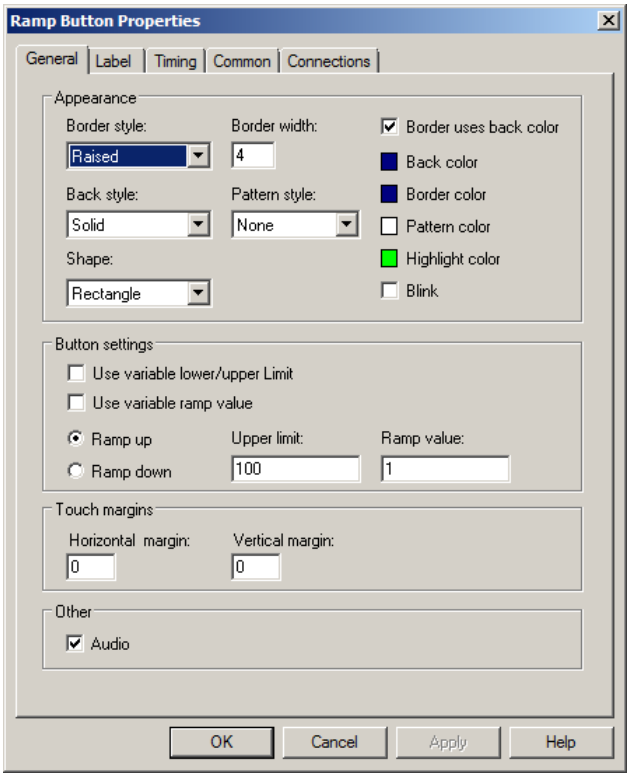
Use the **Ramp** button to increase or decrease the value of a tag.

Ramp buttons can change a tag by either an integer or floating-point value. You can use two Ramp buttons together to create an increment/decrement control.

Each time the operator presses the button, the tag value increases or decreases, depending on how you set up the button.

To set up a Ramp button

1. Double-click the **Ramp** button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the button looks like at run time, whether the button uses variable or constant upper and lower limits and ramp value, and whether the button ramps a value up or down.
   - In the **Label** tab, specify what text or image to show on the button.
   - In the **Timing** tab, set up whether or not the button press repeats automatically when the operator presses and holds the button down, and the rate at which the button press repeats. For more information about auto repeat, see Repeat a button's action by holding down the button on page 399.
   - In the **Common** tab, specify the button's spacial properties, name, and visibility.
   - In the **Connections** tab, specify the tag with which the button exchanges data. If variable ramp and limit values are selected in the **General** tab, assign tags or expressions to the **Ramp** and **Limit** connections. **Ramp** buttons have no **Indicator** connection. For information about assigning tags, see Assign tags and expressions to graphic objects on page 366.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up numeric displays

Use the numeric display object to show the operator numeric information from the data source. For example, you might use a numeric display to show the current temperature of an oven.

How values are shown

The numeric display shows the value of the **Value** connection at the data source. The value shown depends on whether the **Value** connection value is a floating-point number or an integer. Integer values are shown as is. Floating-point values are rounded to fit the display. The decimal places option also affects how floating point numbers are shown.

For example, if the numeric display is set up to show 6 digits, with one decimal place, 1234.56 is rounded to 1234.6. 1234.44 is rounded to 1234.4. The decimal counts as one of the digits.

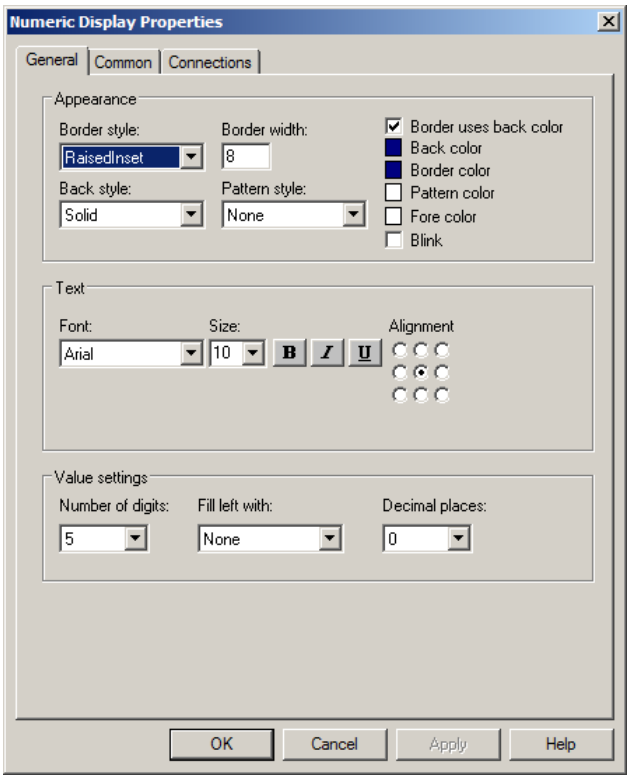
For more information about how values are rounded, see How values are rounded on page 98.

Problems with showing values

- If the **Value** connection is unassigned, the numeric display is filled with asterisks (*).
- If the integer portion of the value, including the decimal point and minus sign, contains more digits than specified for the display, the numeric display is filled with asterisks.
- If the numeric display is sized so that the value cannot be fully shown, the value is truncated and the last showable digit is replaced with an asterisk.
- If the value does not fit on the first line of the display, and there is room for a second line, the value continues onto the second line.

To set up a numeric display

1. Double-click the numeric display.



2. In the object's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the button looks like at run time.
   - In the **Common** tab, specify the button's spacial properties, name, and visibility.
   - In the **Connections** tab, specify the tags or expression whose data is shown. For information, see Assign tags and expressions to graphic objects on page 366.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up Numeric Input Enable buttons

The operator can press the Numeric Input Enable button to open a numeric pop-up keypad or scratchpad, enter a number in the keypad or scratchpad, and then send the number to the data source.

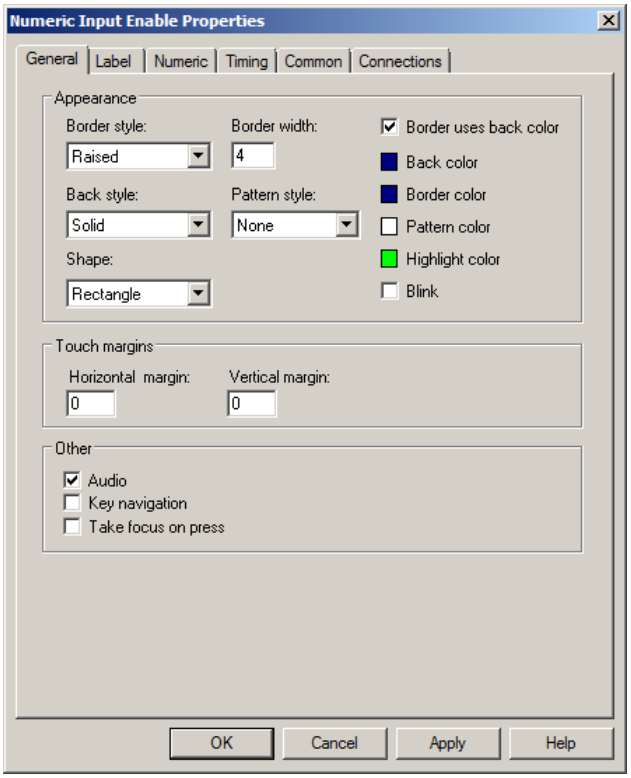
For more information about using the Numeric Input Enable button at run time, see Add a user or group on page 270.

You can also set up the **Numeric Input Enable** button to work as a Ramp button. In this case, when the button has focus, the operator can press a move

up or move down button to change a tag by either an integer or floating-point value. The operator can also press the Up Arrow or Down Arrow on the keyboard or keypad to ramp the value.

To set up a Numeric Input Enable button

1. Double-click the Numeric Input Enable button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the button looks like at run time, whether the operator can navigate to the button using the keys on the keyboard or keypad, and whether the operator can press the button to give it focus.
- In the **Label** tab, specify what text or image to show on the button The same text will appear as a caption on the top of the pop-up that opens when the button is pressed at run time.
- In the **Numeric** tab, set up which pop-up window opens (if any), the ramp value (if any), minimum and maximum values to send to the data source, whether the minimum and maximum values will be variable (from tags or expressions) or constant, and decimal point settings.
- In the **Timing** tab, set up the timing and handshake settings for the **Enter** key. These settings do not apply when you ramp a value. For information about using **Enter key handshaking**, see Methods of Enter key handshaking on page 400.
- In the **Common** tab, specify the button's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tags or expressions with which the button exchanges data. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up numeric input cursor points

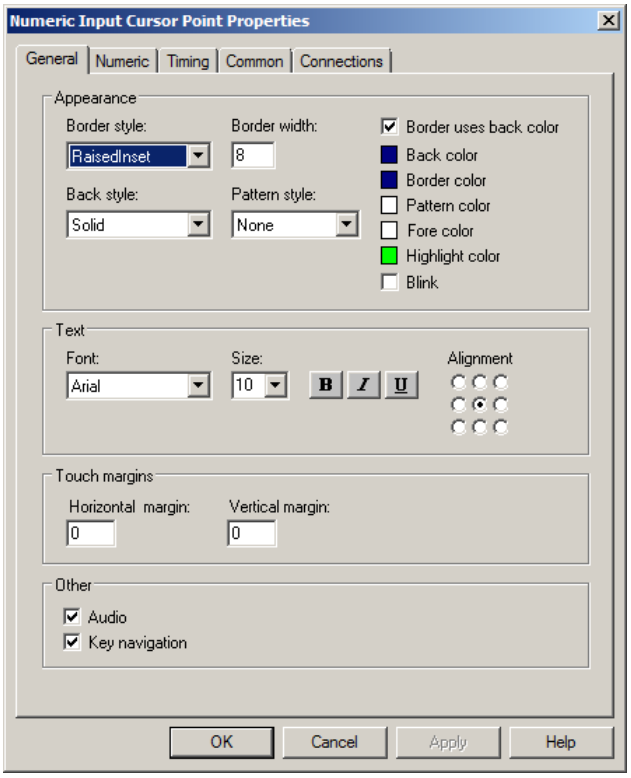
The operator can activate the numeric input cursor point to open a numeric pop-up keypad or scratchpad. The operator can enter a number in the keypad or scratchpad, and then send the number to the data source. The cursor point shows the current value at the data source (if you assign a tag to the **Indicator** connection).

For more information about using the numeric input cursor point at run time, see Add a user or group on page 270.

You can also set up the numeric input cursor point to work as a Ramp button. In this case, when the cursor point has focus, the operator can press a move up or move down button to change a tag by either an integer or floating-point value. The operator can also press the Up Arrow or Down Arrow on the keyboard or keypad to ramp the value.

To set up a numeric input cursor point

1. Double-click the numeric input cursor point.



2. In the object's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the cursor point looks like at run time, and whether the operator can navigate to the cursor point using the keys on the keyboard or keypad.
- In the **Numeric** tab, set up which pop-up window opens (if any), what caption (if any) will be shown on the pop-up, the ramp value (if any), minimum and maximum values to send to the data source, whether the minimum and maximum values will be variable (from tags or expressions) or constant, decimal point settings, and display settings.
- In the **Timing** tab, set up the timing and handshake settings for the **Enter** key. These settings do not apply when you ramp values. For information about using **Enter key handshaking**, see Methods of Enter key handshaking on page 400.
- In the **Common** tab, specify the button's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tags or expression with which the numeric input cursor point exchanges data. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up string displays

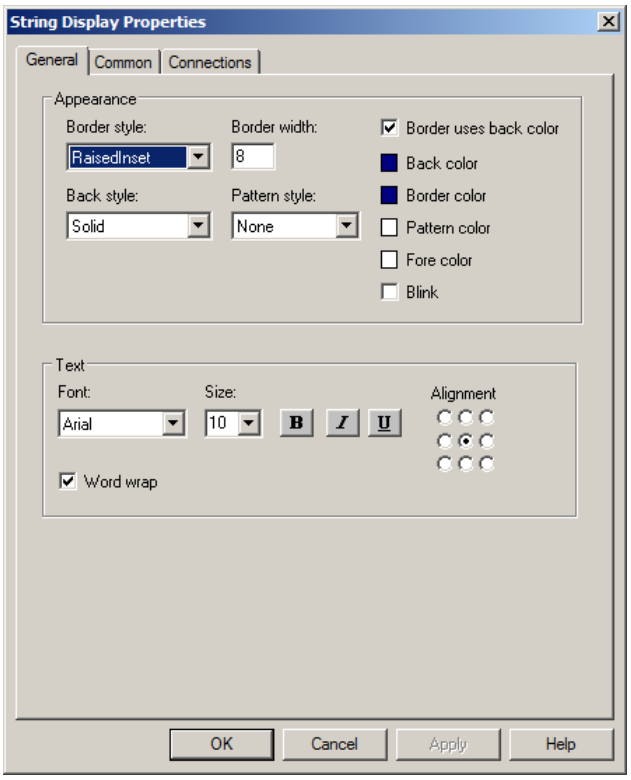
Use the string display object to show the operator messages from the data source. For example, you might set up the data source to generate strings that report on the state of a process or operation, or that provide instructions about what the operator needs to do next. At run time, the display shows the operator the string value of the **Value** connection at the data source.

How values are shown

- If the **Value** connection is unassigned, the string display is blank.
- FactoryTalk View shows the number of characters (bytes) specified for the tag assigned to the **Value** connection.

To set up a string display

1. Double-click the string display.



2. In the object's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the string display looks like at run time.
   - In the **Common** tab, specify the string display's spacial properties, name, and visibility.
   - In the **Connections** tab, specify the tag or expression whose data is shown. For information, see Assign tags and expressions to graphic objects on page 366.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

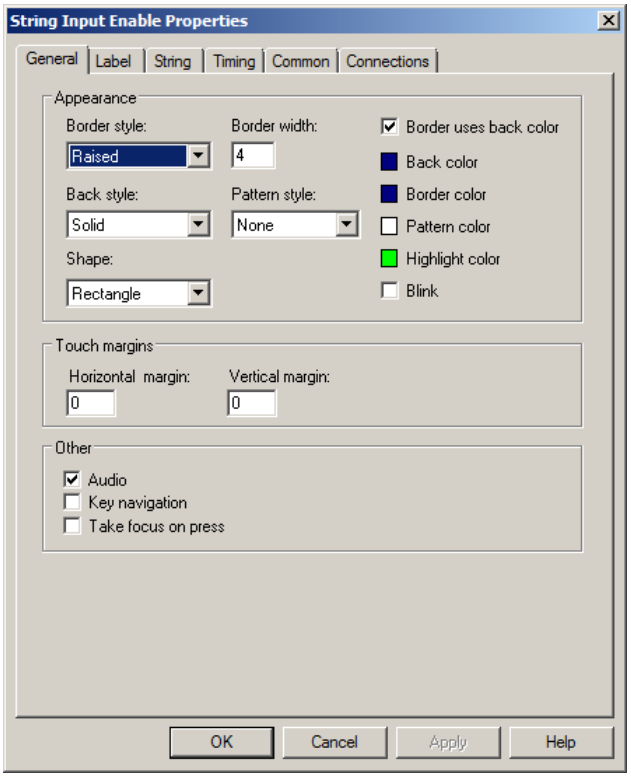
Set up String Input Enable buttons

The operator can press the **String Input Enable** button to open a string pop-up scratchpad or keyboard. The operator can enter text in the scratchpad or keyboard, and then send the string to the data source.

For more information about using the **String Input Enable** button at run time, see Add a user or group on page 270.

To set up a String Input Enable button

1. Double-click the **String Input Enable** button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the button looks like at run time, whether the operator can navigate to the button using the keys on the keyboard or keypad, and whether the operator can press the button to give it focus.
   - In the **Label** tab, specify what text or image to show on the button.

     The same text will appear as a caption on the pop-up that appears when the button is pressed at run time.

- In the **String** tab, specify the pop-up to open and the number of characters to accept.
- In the **Timing** tab, set up the timing and handshake settings for the **Enter** key. For information about using **Enter key handshaking**, see Methods of Enter key handshaking on page 400.
- In the **Common** tab, specify the button's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tags or expression with which the button exchanges data. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

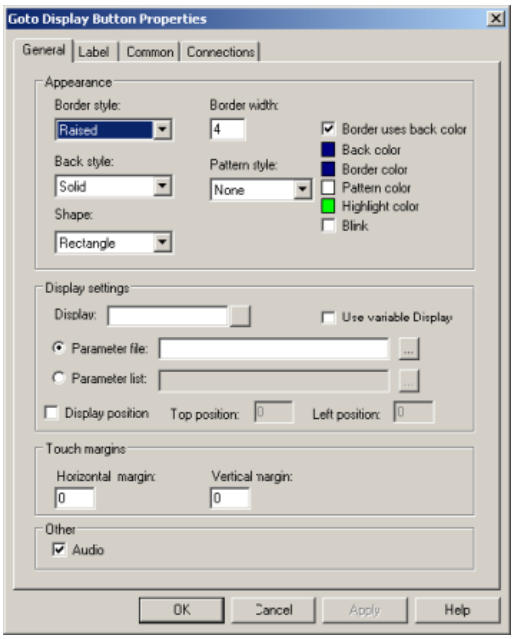
Set up Goto display buttons

Use the Goto display button to open a graphic display. You can create as many Goto display buttons as you need, but each button opens a single display only.

For more information about using Goto display buttons, see Goto display buttons on page 216.

To set up a Goto display button

1. Double-click the Goto display button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the button looks like at run time, the display to open, and the parameter file or parameter list to use, if any.
- In the **Label** tab, specify what text or image to show on the button.
- In the **Common** tab, specify the button's spacial properties, name, and visibility.
- In the **Connections** tab, assign a tags or expressions as needed.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

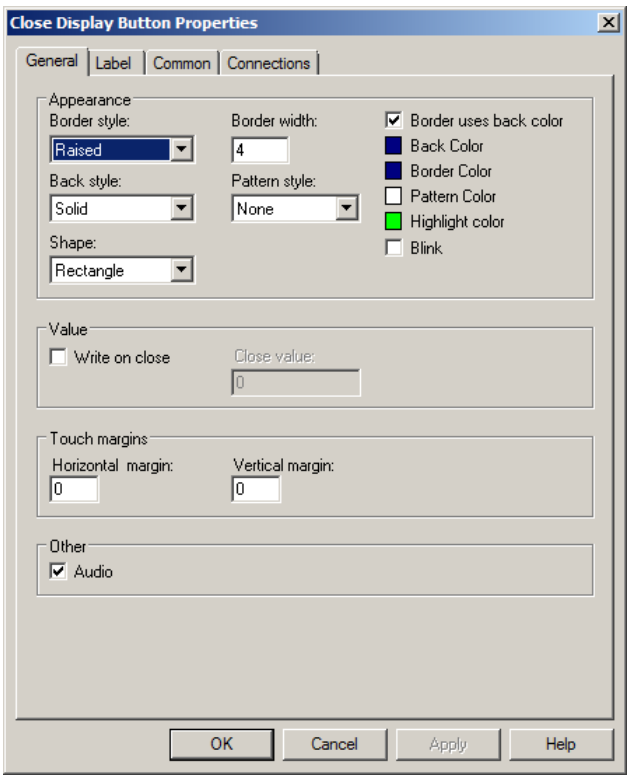
Set up close display buttons

When the operator presses a close display button at run time, the graphic display that the button is on closes. You can set up the button to write out a value when the display closes.

For more information about using close display buttons, see Close display buttons on page 218.

To set up a Close Display button

1. Double-click the button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the button looks like at run time, and whether to write out a value when the display closes.
- In the **Label** tab, specify what text or image to show on the button.
- In the **Common** tab, specify the button's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tag with which the button exchanges data. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

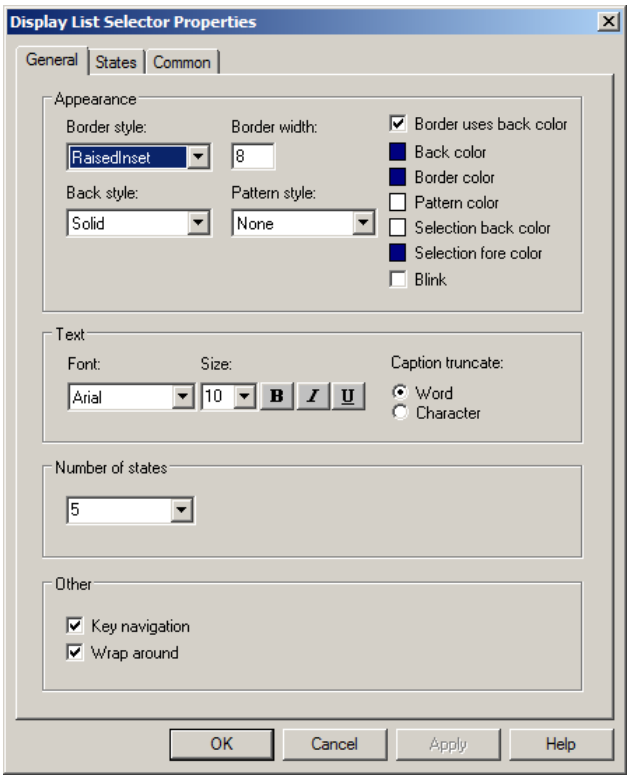
Set up display list selectors

The display list selector is a list of graphic shows in the application. Each graphic display is represented by a different state in the display list selector. An operator can scroll through the list of displays, and then select the display to open by pressing an **Enter** button, or **Enter** key.

For more information about using display list selectors, see Display list selectors on page 218.

To set up a display list selector

1. Double-click the display list selector.



2. In the object's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the selector looks like at run time, its number of states, whether the operator can navigate to the selector using the keys on the keyboard or keypad, and whether the cursor wraps from the bottom of the list back to the top.
   - In the **States** tab, specify which graphic display to use for each of the display list selector's states, whether the display will use a parameter file or list when it opens, its opening position, and how each graphic display is named in the list. For tips about setting up states, see Tips for setting up objects with states on page 390.
   - In the **Common** tab, specify the display list selector's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

How to use indicators

Indicators show the status of processes or operations by showing different colors, captions, or images to reflect different states.

You can create different kinds of indicators to suit your needs:

- **Multistate indicators** show the current state of a process or operation by showing a different color, caption, or image to reflect different states.
- **Symbols** show a symbol that changes color to indicate the state of a process or operation. This allows the operator to see the status of a process or operation at a glance.
- **List indicators** show a list of states for a process or operation, and highlight the current state. Each state is represented by a caption in the list. This type of indicator is useful if you want operators to view the current state, but also see the other possible states. For sequential processes, the list can inform the operator about what happens next.

Set up multistate indicators

The multistate indicator shows the current state of a process or operation by showing a different color, caption, or image for each state.

The error state

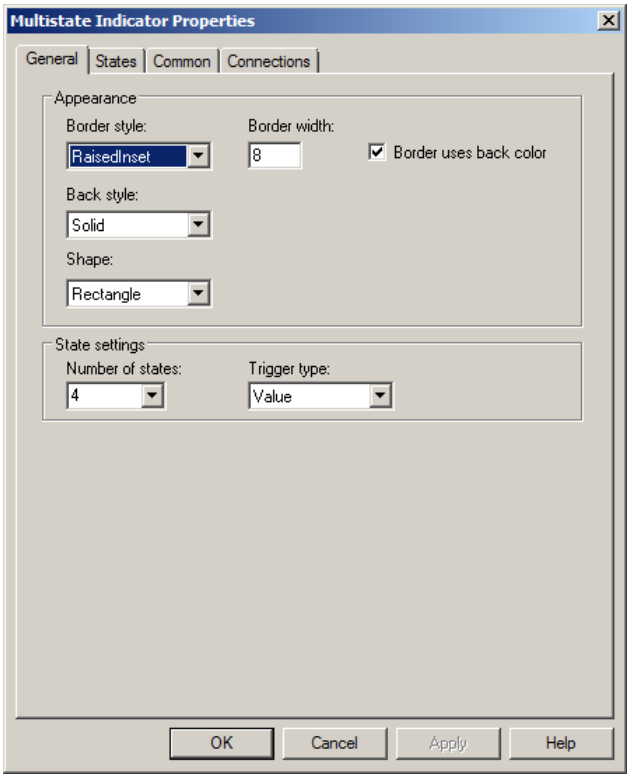
The multistate indicator's error state is shown at run time when:

- The **Indicator** connection is unassigned.
- The **Indicator** connection's value does not match one of the state values you set up.

- The **Trigger** type is set to **Value**, and the **Indicator** connection value does not match one of the state values you set up.
- The **Trigger** type is set to **LSB**, and the position of the least significant bit set in the **Value** connection does not match one of the state values you set up.
- The **Trigger** type is set to **Value**, and an array tag has been assigned to the object's **Value** connection.

To set up a multistate indicator

1. Double-click the multistate indicator.



2. In the object's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the indicator looks like, and the number of states for the indicator.
- In the **States** tab, specify how the indicator's appearance changes when its tag or expression's value changes. For tips about setting up states, see Tips for setting up objects with states on page 390.
- In the **Common** tab, specify the indicator's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tag or expression from which the indicator receives data. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up symbols

The symbol is an indicator that shows a single monochrome image that changes color to match the state of a process or operation. This allows the operator to see the status of a process or operation at a glance.

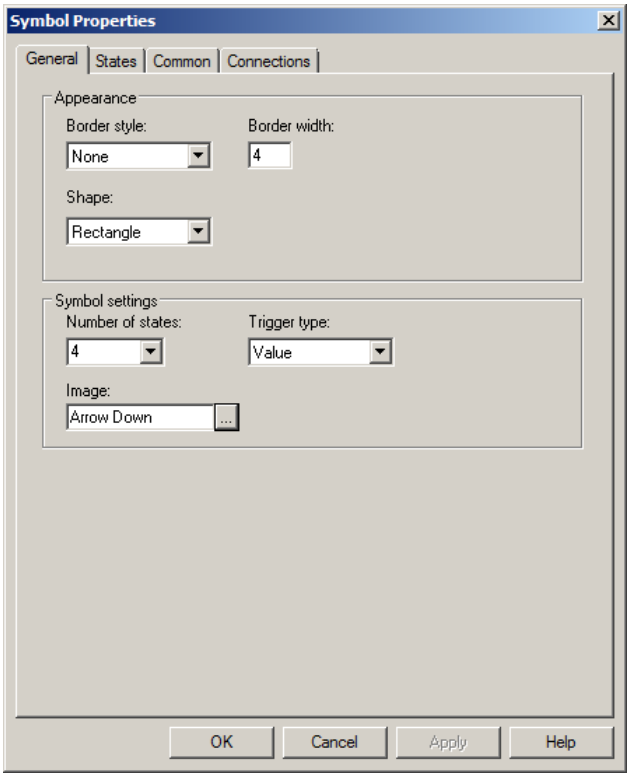
The error state

The symbol's error state is shown at run time when:

- The **Indicator** connection is unassigned.
- The **Indicator** connection's value does not match one of the state values you set up.
- The **Trigger** type is set to **Value**, and the **Indicator** connection value does not match one of the state values you set up.
- The **Trigger** type is set to **LSB**, and the position of the least significant bit set in the **Value** connection does not match one of the state values you set up.
- The **Trigger** type is set to **Value**, and an array tag has been assigned to the object's **Value** connection.

To set up a symbol

1. Double-click the symbol.



2. In the object's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the symbol looks like at run time, and the number of states for the symbol.
   - In the **States** tab, specify how the symbol's appearance changes when its tag or expression's value changes. For tips about setting up states, see Tips for setting up objects with states on page 390.
   - In the **Common** tab, specify the symbol's spacial properties, name, and visibility.
   - In the **Connections** tab, specify the tag or expression from which the symbol receives data. For information, see Assign tags and expressions to graphic objects on page 366.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up list indicators

The list indicator shows a list of states for a process or operation, and highlights the current state.

Each state is represented by a caption in the list. This type of indicator is

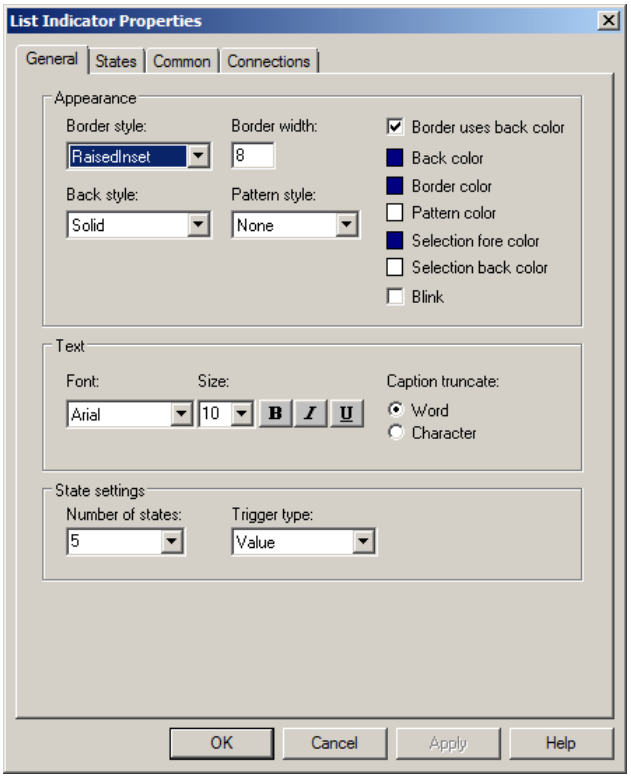
useful if you want operators to view the current state, but also see the other possible states.

For sequential processes, the list can inform the operator about what happens next.

The list indicator has no error state. If the value of the **Indicator** connection does not match any of the available states, none of the states is highlighted.

To set up a list indicator

1. Double-click the list indicator.



2. In the object's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the indicator looks like at run time, and the number of states for the indicator.
- In the **States** tab, specify how the indicator's appearance changes when its tag or expression's value changes. For tips about setting up states, see Tips for setting up objects with states on page 390.
- In the **Common** tab, specify the indicator's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tag or expression from which the indicator receives data. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

How to use bar graphs, gauges, and scales

Bar graphs and gauges show graphical representations of numeric values. The scale is used with bar graphs to indicate the range of values for the bar graph.

Bar graphs make it easy to compare values

Bar graphs show numeric values in bar graph format. They are useful for allowing comparisons between multiple values, or for representing the fill levels of tanks for which a reading on a vertical scale is appropriate.

For example, one bar graph can show the required level of a tank, and a second bar graph can show the actual level of the tank. The first graph can change to represent the required level for a particular application, and the second graph changes as the actual level in the tank rises or drops.

Bar graphs are more useful than numeric displays when it's important for the operator to analyze the relationships between numeric values. It's easier for the operator to see that one graph is at a lower level than the other, or that one's fill is blue and the other's is yellow, than it is to subtract one numeric value from another.

Thresholds change a bar graph's fill color

As it fills, a bar graph can change its fill color to help an operator recognize abnormal conditions. The change in color happens when the tag (or expression) value crosses a threshold you set up for the graph. For example:

- If the temperature of an oven is lower than required for a recipe, the bar graph can show the temperature in blue.
- If the temperature is in the correct range for the recipe, the bar graph can show the temperature in green.

- If the temperature is higher than the recipe allows, the bar graph can show the temperature in red.

If you want to use a different fill color on a bar graph to show abnormal conditions, make sure enough of the new fill color is visible when the abnormal condition occurs that the operator can see the condition.

Use bar graphs with scales to show limits

Unlike gauges, bar graphs do not have integrated scales. You can show values on a bar graph using a scale graphic object and text.

Scales consist of major ticks, represented by long lines, and minor ticks, represented by short lines. To indicate the values of major or minor ticks, use text objects.

Gauges make it easy to see limits

Gauges show numeric values in dial format. They are useful for showing a value in relation to its lower and upper limits.

For example, a temperature gauge shows the current temperature in relation to its minimum and maximum extremes. By looking at the position of the needle on the gauge (pointing left, up, or right), the operator can tell at a glance whether the temperature is nearer its lower limit, nearer the middle, or nearer its upper limit.

Gauges are used instead of numeric displays when it's important for the operator to recognize an abnormal condition instantly, either from far away when the scale on the gauge isn't visible, or before the operator has had the opportunity to determine the exact reading on the gauge. This characteristic of gauges is one of the reasons why they are used in automobile instrumentation.

Thresholds change a gauge's fill color

As the needle sweeps higher on a gauge, the gauge can fill the area behind the needle with a color. The gauge can change its fill color to help an operator recognize abnormal conditions. The change in color happens when the tag (or expression) value crosses a threshold you set up for the gauge. For example:

- If the temperature of an oven is lower than required for a recipe, the gauge can show the temperature in blue.
- If the temperature is in the correct range for the recipe, the gauge can show the temperature in green.

- If the temperature is higher than the recipe allows, the gauge can show the temperature in red.

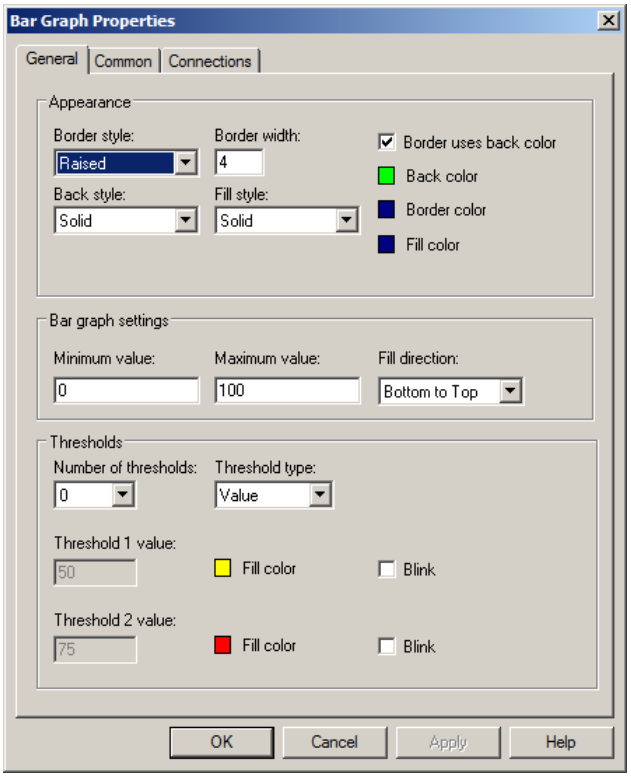
  Note: Some people are color blind to red and green, so don't rely on color alone to establish meaning.

Set up bar graphs

Use bar graphs to represent numeric values by filling and emptying the object as the values rise and fall.

To set up a bar graph

1. Double-click the bar graph.



2. In the object's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the bar graph looks like at run time.
- In the **Common** tab, specify the bar graph's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tag or expression from which the bar graph receives data. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

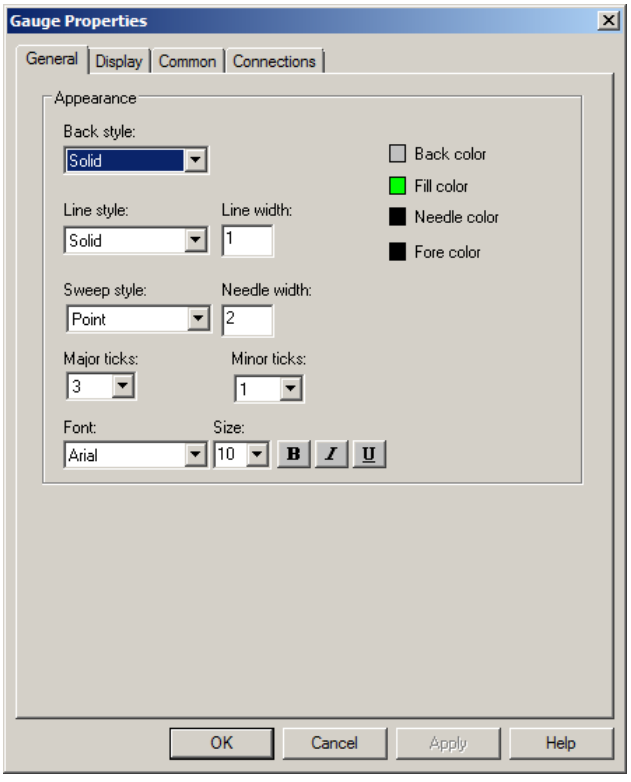
Set up gauges

The gauge graphic object represents numeric values using a needle on a dial.

At run time, the gauge indicates the value of a tag or expression in relation to the gauge's minimum and maximum values.

To set up a gauge

1. Double-click the gauge.



2. In the object's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the gauge looks like at run time.
- In the **Display** tab, specify how the gauge shows values at run time.
- In the **Common** tab, specify the gauge's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tag or expression from which the gauge receives data. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

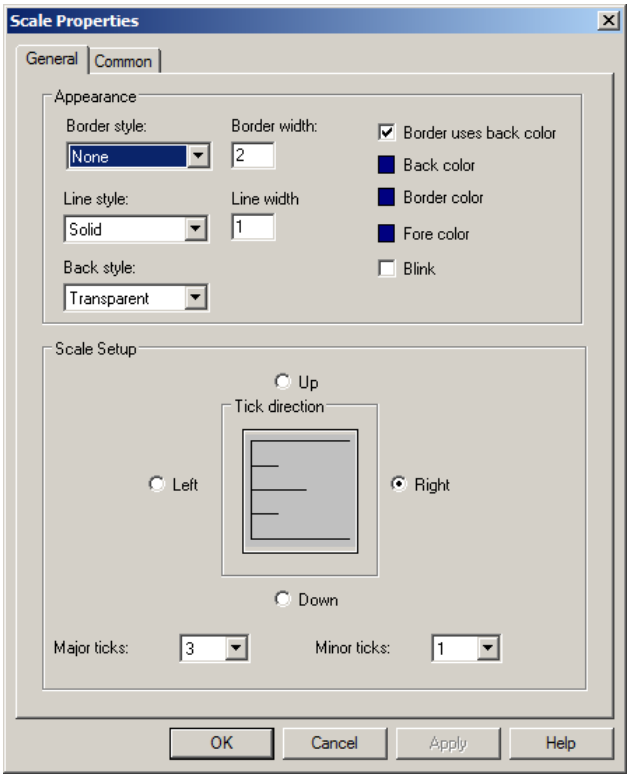
Set up scales

Use the scale graphic object to show the possible range of values for a bar graph.

To place value labels on the scale (to create a legend), use text objects. Create the text objects and then position them next to the tick marks on the scale. Group all the objects with the bar graph.

To set up a scale

1. Double-click the scale.



2. In the object's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the scale looks like at run time.
   - In the **Common** tab, specify the scale's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up control list selectors

Control list selectors allow an operator to scroll through a list of states for a process and select one of the states. A highlight in the list shows the current state.

A control list selector can show several states at the same time, but only one state can be selected at a time. As the operator scrolls through the list, each successive state is selected automatically. If you want the operator to confirm the selection of a particular state before the state's value is written to the programmable controller, create an enter button on the same display as the control list selector, and select the **Write on enter** option.

The operator can scroll through the control list selector using:

- Key button graphic objects. These are graphic objects that duplicate the functions of keyboard keys.
- The arrow keys and **Enter** key on a terminal's keypad.
- The arrow keys and **Enter** key on a keyboard.

Use buttons with the control list selector

The operator presses the buttons to scroll up or down the list, or to make selections from the list. The buttons can be set up to work with the control list selector that has input focus, or you can link the buttons to a specific control list selector.

Use this button	To do this
Backspace	Move the cursor back to the highlighted item in the list.
End	Move to the bottom item in the list.
Enter	Select the item the cursor is pointing to.
Home	Move to the top item in the list.
Move down	Move down one item in the list.
Move up	Move up one item in the list.
Page down	Move down one page in the list.
Page up	Move up one page in the list.

How Enter key handshaking works

When the operator selects a state in the control list selector and presses an enter button or **Enter** key, the highlighted state's value is written to the programmable controller or device.

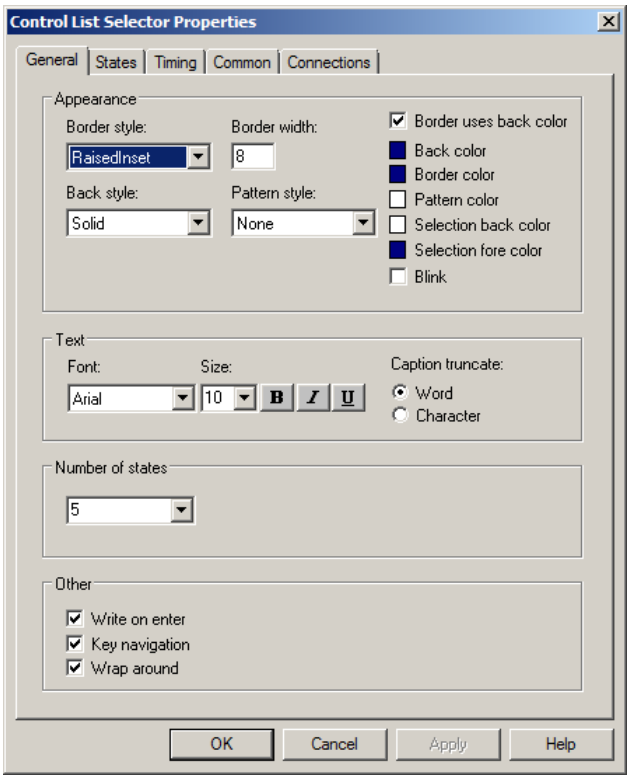
You can use **Enter key handshaking** to hold the value of the tag at the programmable controller or device for a specific period of time, to ensure the value is read before the control list selector overwrites the value with a new value.

Enter key handshaking only works if the **Write on enter** check box is selected (in the **General** tab).

For information about using **Enter key handshaking**, see Methods of Enter key handshaking on page 400.

To set up a control list selector

1. Double-click the control list selector.



2. In the object's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the selector looks like at run time, its number of states, whether to write out a value when the operator presses the Enter key, whether the operator can navigate to the selector using the keys on the keyboard or keypad, and whether the cursor wraps from the bottom of the list back to the top.
- In the **States** tab, set up the value and caption for each state. The value defines the control list selector's action, by changing the **Value** connection to the value you specify when the selected state is in effect. For tips about setting up states, see Tips for setting up objects with states on page 390.
- In the **Timing** tab, set up the timing and handshake settings for the **Enter** key. For information about using **Enter key handshaking**, see Methods of Enter key handshaking on page 400.
- In the **Common** tab, specify the control list selector's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tags or expression with which the control list selector exchanges data. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up piloted control list selectors

Piloted control list selectors allow an operator or remote device to scroll through a list of states for a process and select one of the states. A highlight in the list shows the current state.

Choose between piloted control list selectors and control list selectors

Piloted control list selectors include the following features that control list selectors do not:

- The states can be selected either by an operator, or remotely, for example by a programmable controller, or by both an operator and a remote device. Individual states can be turned off, to prevent them from being selected by either the operator or the remote device.

  Control list selectors do not allow states to be turned off.

- The state values of all of the items that are visible in the list can be written to the **Visible States** connection when the list scrolls. The **Visible States** connection must be a data-server tag that supports arrays. You cannot use an HMI tag.

  Control list selectors have no **Visible States** connection.

- The state value of the item at the top of the list can be written to the **Top Position** connection when the list scrolls.

Control list selectors have no **Top Position** connection.

How piloted control list selectors work at run time

A piloted control list selector can show several states at the same time, but only one state can be selected at a time.

You can set up the piloted control list selector to be operator-controlled or remote-controlled by assigning tags or expressions in the Connections tab.

You can also set up individual states to be operator-controlled, remote-controlled, both, or none. If set to none, the state is turned off.

If the piloted control list selector is set up to be operator-controlled, and the operator selects a remote-controlled state, or one that is turned off, a hollow cursor is shown.

The operator can select this state.

The operator cannot select this state.

Use buttons with the piloted control list selector

When a piloted control list selector is operator-controlled, it works with:

- **Key** button graphic objects. These are graphic objects that duplicate the functions of keyboard keys.
- The arrow keys and **Enter** key on a terminal's keypad.
- The arrow keys and **Enter** key on a keyboard.

The operator presses the buttons to scroll up or down the list, or to make selections from the list. The buttons can be set up to work with the piloted control list selector that has focus, or with a specific piloted control list selector. You can use the buttons listed in the table in Use buttons with the control list selector on page 438.

Select items in the list

Each state can be selected directly by an operator, or remotely by a device such as a programmable controller. The operator or the controller scrolls through the list to select a different state or a different group of visible states.

When an operator or remote device selects a state, the value assigned to the selected state is written to the piloted control list selector's **Value**

connection. If the state is turned off, the state's value is not written to the **Value** connection.

If the operator attempts to select a state that is remote-controlled, the state's value is not written to the **Value** connection.

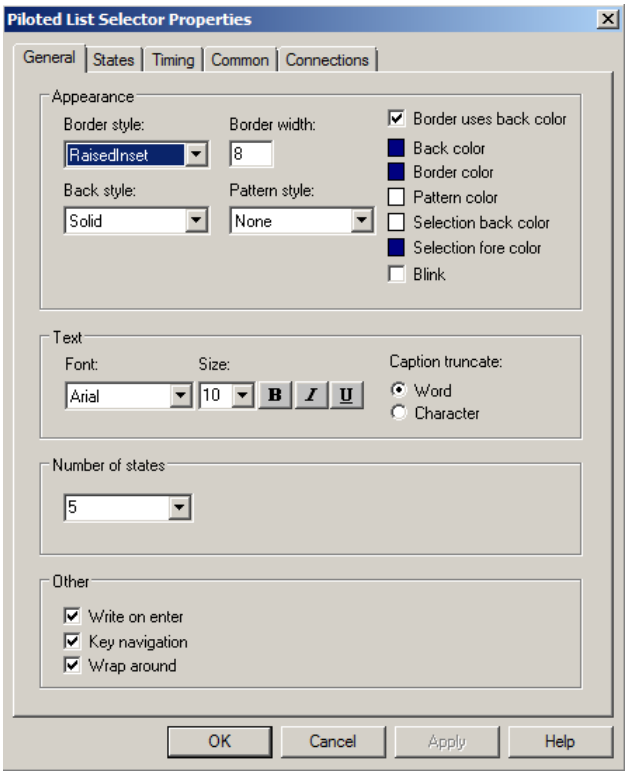
Scrolling through the list

If the piloted control list selector contains more states than can be shown in the list simultaneously, the value of the **Top Position** connection (if assigned) changes whenever the item at the top of the list changes.

If the **Visible States** connection is assigned, the values assigned to all visible states are written to the **Visible States** connection whenever the list scrolls. To use this feature, the assigned tag must support arrays, and the array must be the same length as the number of visible states in the piloted control list selector. For information about using array tags, see Tips for using array tags on page 133.

To set up a piloted control list selector

1. Double-click the piloted control list selector.



2. In the object's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the selector looks like at run time, its number of states, whether to write out a value when the operator presses the Enter key, whether the operator can navigate to the selector using the keys on the keyboard or keypad, and whether the cursor wraps from the bottom of the list back to the top.
- In the **States** tab, set up the value and caption for each state. Also specify whether each state can be selected, and by whom. For tips about setting up states, see Tips for setting up objects with states on page 390.
- In the **Timing** tab, set up the timing and handshake settings for the **Enter** key. For information about using **Enter key handshaking**, see Methods of Enter key handshaking on page 400.
- In the **Common** tab, specify the piloted control list selector's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tags or expression with which the piloted control list selector exchanges data. For information, see Assign tags and expressions to graphic objects on page 366.

For details about the options in the tabs, see Help.

3. When you are finished, click OK.

Set up local message displays

Use local message displays to provide the operator with information about what to do next, or with information about a process. At run time, the local message display shows one message at a time.

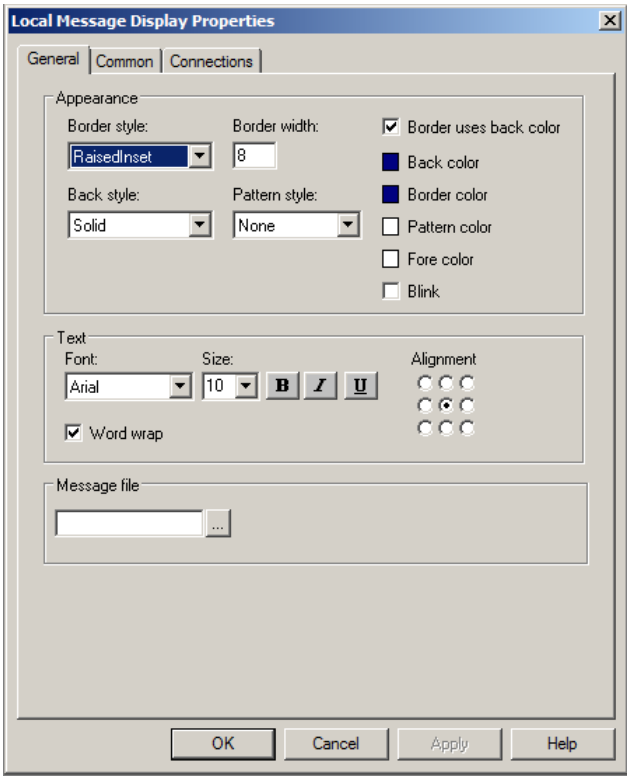
To use local messages, create a local message display object in a graphic display, and then assign a local message file to the local message display object.

For more information about local messages, see Use local messages on page 325.

If no message exists for the trigger value that matches the value of the **Value** connection, the display is filled with question marks (?).

To set up a local message display

1. Double-click the local message display.



2. In the object's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the local message display looks like at run time and which local message file to use.
   - In the **Common** tab, specify the local message display's spacial properties, name, and visibility.
   - In the **Connections** tab, specify the tag or expression with which the local message display exchanges data. For information, see Assign tags and expressions to graphic objects on page 366.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

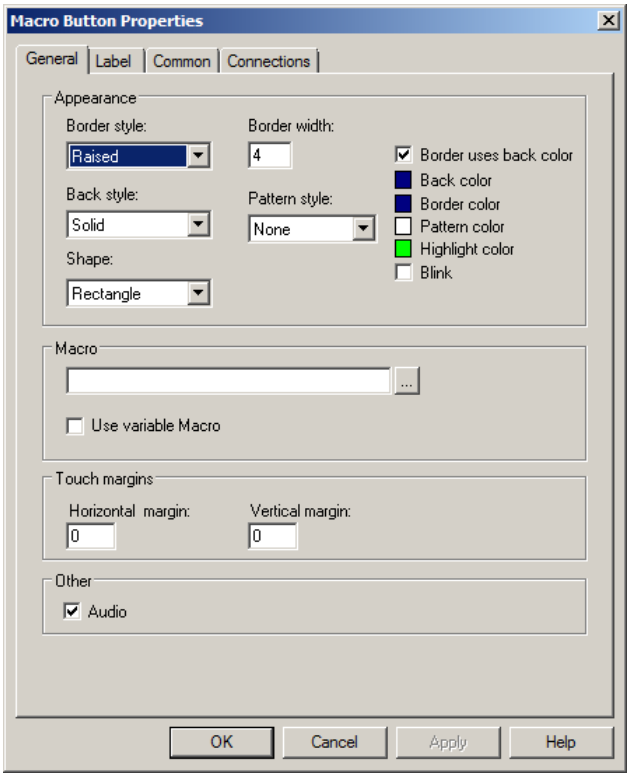
Set up Macro buttons

Macro buttons run macro files that assign values to tags when the button is pressed.

For information about creating macros, see Use macros on page 561.

To set up a Macro button

1. Double-click the button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the button looks like at run time, and the macro to run when the button is pressed.
   - In the **Label** tab, specify what text or image to show on the button.
   - In the **Common** tab, specify the button's spacial properties, name, and visibility.
   - In the **Connections** tab, assign tags or expressions to the connections for the macro name.

   For details about the options in the tabs, see Help.

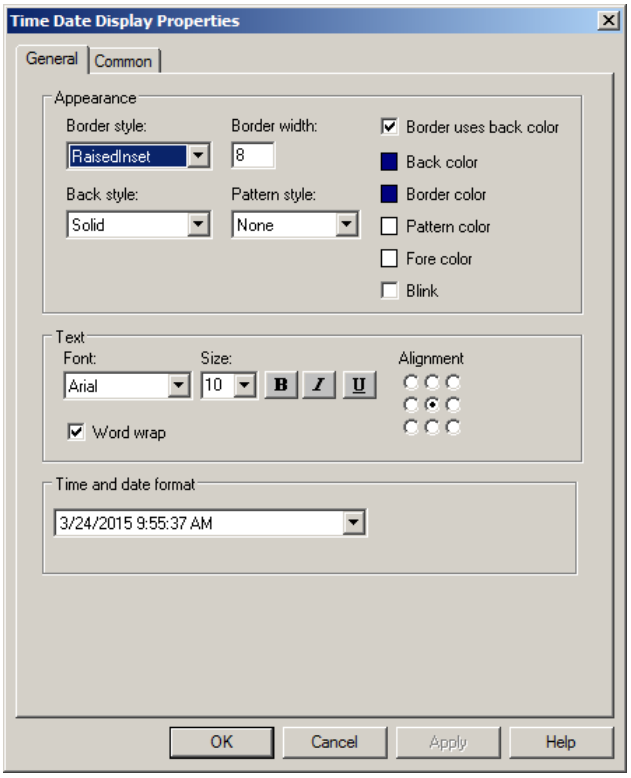
3. When you are finished, click **OK**.

Set up time and date displays

A time and date display shows the current time and date in a graphic display.

To set up a time and date display

1. Double-click the time and date display.



2. In the object's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the time and date display looks like at run time.
   - In the **Common** tab, specify the time and date display's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

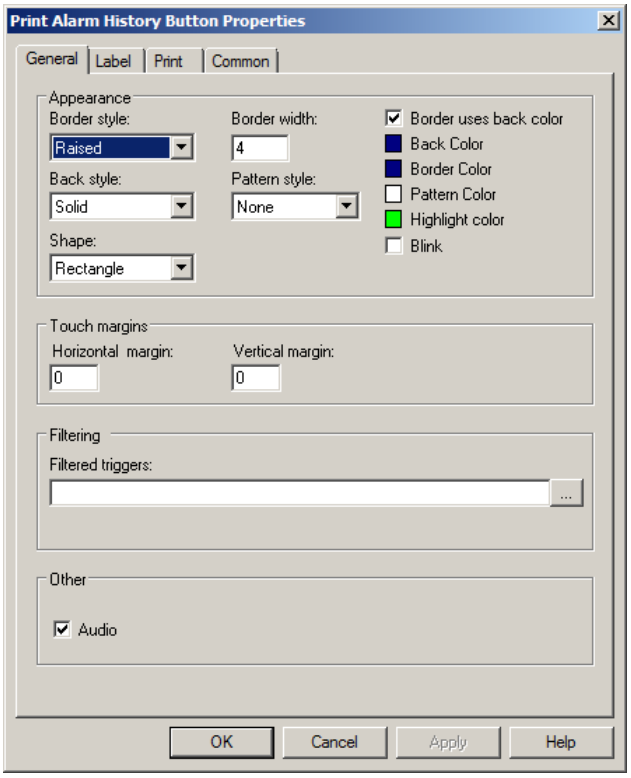
Set up Print Alarm History buttons

The operator can press the Print Alarm History button to print a report of all the alarm messages in the alarm log file. The report can include the time alarms occurred and were acknowledged.

For information about the alarm log file, see The alarm log file on page 129.

To set up a Print Alarm History button

1. Double-click the button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the button looks like at run time, and whether to filter the alarms to include in the report.
   - In the **Label** tab, specify what text or image to show on the button.
   - In the **Print** tab, specify what information to print on the report.
   - In the **Common** tab, specify the button's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

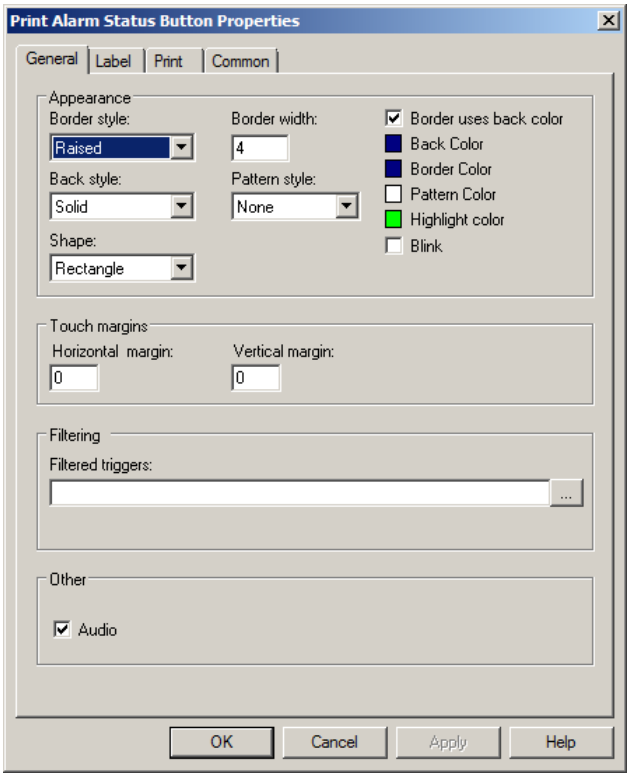
3. When you are finished, click **OK**.

Set up Print Alarm Status buttons

The operator can press the Print Alarm Status button to print a report of the status of alarms that have been defined for the application (in the **Alarm Setup** editor). The report can include all alarms, active alarms only, or only alarms that have been active since the alarm status was last reset. The report can include how many times each alarm was triggered, and the accumulated time in alarm.

To set up a Print Alarm Status button

1. Double-click the button.



2. In the button's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the button looks like at run time, and whether to filter the alarms to include in the report.
   - In the **Label** tab, specify what text or image to show on the button.
   - In the **Print** tab, specify what information to print on the report.
   - In the **Common** tab, specify the button's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up alarm lists

The alarm list graphic object shows a list of alarms from the alarm log file. It can show all the alarms in the alarm log file, or any combination of active, inactive, acknowledged, and unacknowledged alarms. It can also show the alarms for specific alarm triggers.

You can assign a tag or expression to the ActiveAcknowledged, ActiveUnacknowledged, InactiveAcknowledged, or InactiveUnacknowledged connections, to allow the data source to control the

type of alarms to show in the list. When one of the connection's values is a non-zero value, the related type of alarm is shown in the alarm list. The connection value overrides the setting for the list in the **Alarm List Properties** dialog box.

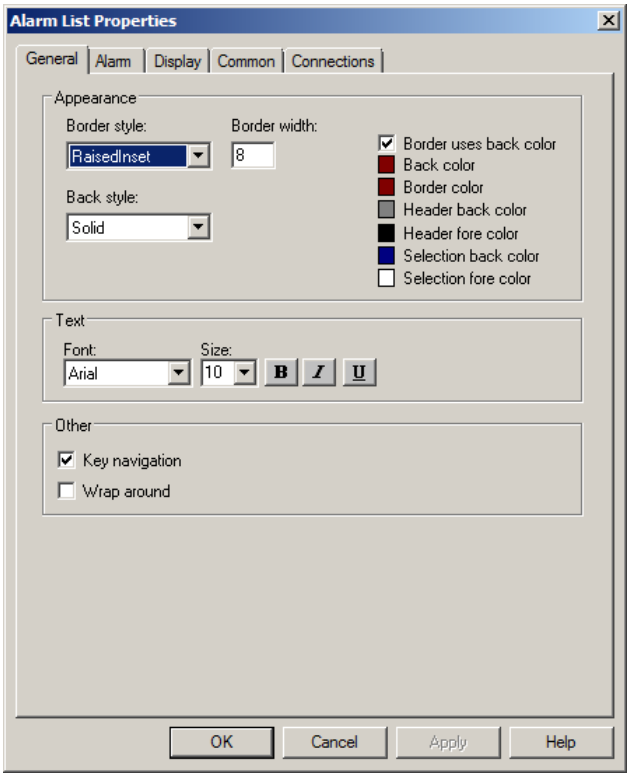
FactoryTalk View comes with two graphic displays, [ALARM MULTI-LINE] and [HISTORY], that contain alarm list objects. The [HISTORY] display comes in two sizes. These displays are in the graphic library. You can copy the library displays into your application and use the displays and objects as is, customize them, or create your own.

For more information about using alarm lists, see How the alarm list graphic object works on page 150.

For information about the alarm log file, see The alarm log file on page 129.

To set up an alarm list

1. Double-click the alarm list.



2. In the object's **Properties** dialog box, fill in the options on each tab:

- In the **General** tab, specify what the button looks like at run time, whether the operator can navigate to the list using a keyboard, and how scrolling works for the list.
- In the **Alarm** tab, specify the columns to include in the list, the number of lines per alarm, and the triggers to filter by, if any.
- In the **Display** tab, specify the types of alarms to show in the list, and the appearance of the different alarm conditions.
- In the **Common** tab, specify the alarm list's spacial properties, name, and visibility.
- In the **Connections** tab, specify the tags or expressions to use to control the type of alarms to show in the list. The use of these connections is optional.

For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up alarm banners

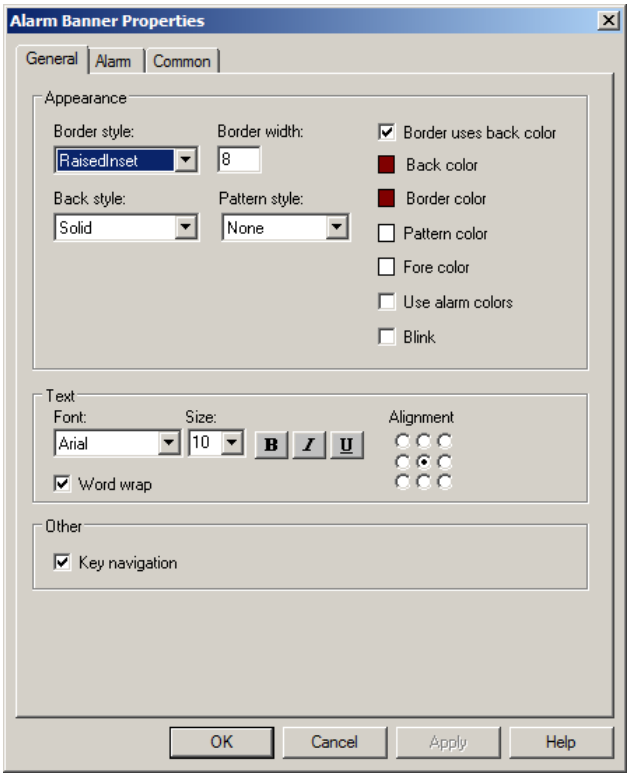
The alarm banner graphic object shows a single unacknowledged alarm message. For example, the banner could show a message that warns the operator that the pressure in a boiler is too high.

The [ALARM] display and the [ALARM BANNER] graphic library both contain an alarm banner object. You can use the displays and objects as is, customize them, or create your own.

For more information about using alarm banners, see How the alarm banner graphic object works on page 152.

To set up an alarm banner

1. Double-click the alarm banner.



2. In the object's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the banner looks like at run time and whether the operator can navigate to the banner using the keys on the keyboard or keypad.
   - In the **Alarm** tab, set up whether to queue alarms, whether to show all alarms or active alarms only, and which alarms to include in a filtered trigger list.
   - In the **Common** tab, specify the alarm banner's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up alarm status lists

The alarm status list graphic object shows the status of alarms, including how many times an alarm has been triggered and how long it has been active. For example, the list could display an alarm that has been triggered five times for a total accumulated time in alarm of 10 minutes.

The operator can view the status list in three different modes:

- **All alarms** — shows the status of all alarms that have been defined in the **Alarm Setup** editor.
- **Active alarms** — shows the status of all the alarms that are currently active.
- **Past alarms** — shows the status of all the alarms that have been active since the alarm status has been reset.

The operator can press the alarm status mode button to cycle through the different modes.

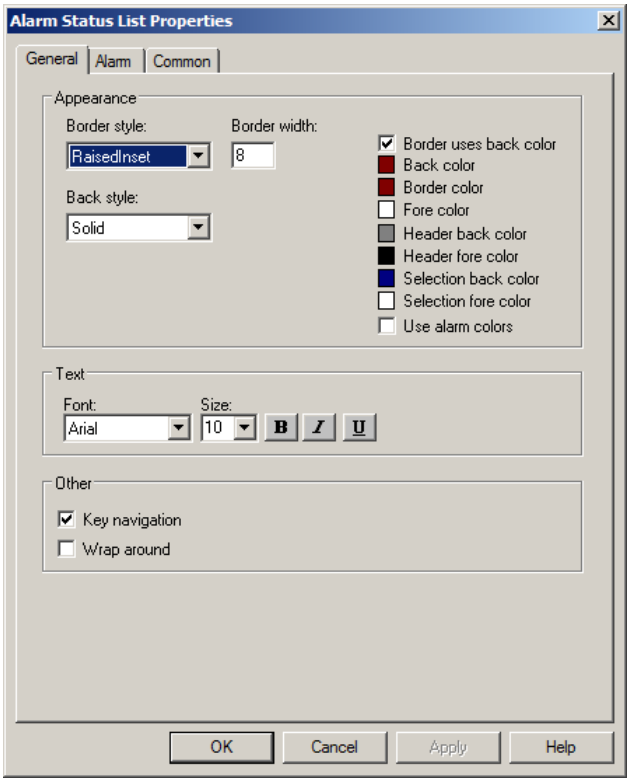
If desired, you can set up the alarm status list to show alarms for specific alarm triggers only.

FactoryTalk View comes with a library graphic display called [STATUS] that contains an alarm status list object, alarm status mode button, and other buttons for working with the list. You can use the display and objects as is, customize them, or create your own.

For more information about using alarm status lists, see How the alarm status list graphic object works on page 153.

To set up an alarm status list

1. Double-click the alarm status list.



2. In the object's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the alarm status list looks like at run time, whether the operator can navigate to the list using a keyboard, and how scrolling works for the list.
   - In the **Alarm** tab, specify the columns to include in the list, the number of lines per alarm, and the triggers to filter by, if any.
   - In the **Common** tab, specify the alarm status list's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up diagnostics lists

The diagnostics list graphic object shows runtime information about system activity:

- **Information messages**, such as messages about tag assignments, tag read and write activity, and macro usage.

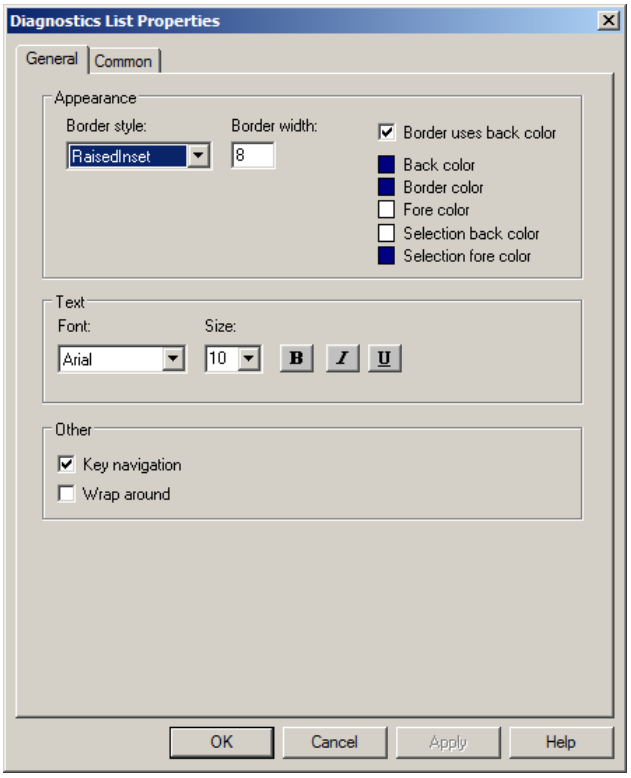
  These are system-generated information messages. They are not the same messages as the information messages you create and show in the information message display object.
- **Warning messages**.
- **Error messages**, such as messages about communication errors, invalid values, and unassigned connections.
- **Audit messages** about tag writes and tag write failures.

FactoryTalk View comes with a default graphic display called [DIAGNOSTICS] that contains a diagnostics list object. You can use the display and object as is, customize them, or create your own.

For more information about using diagnostics lists, see How the diagnostics list graphic object works on page 173.

To set up a diagnostics list

1. Double-click the diagnostics list.



2. In the object's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the list looks like at run time, whether the operator can navigate to the list using the keys on the keyboard or keypad, and whether the cursor wraps from the bottom of the list back to the top.
   - In the **Common** tab, specify the diagnostics list's spatial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Set up information message displays

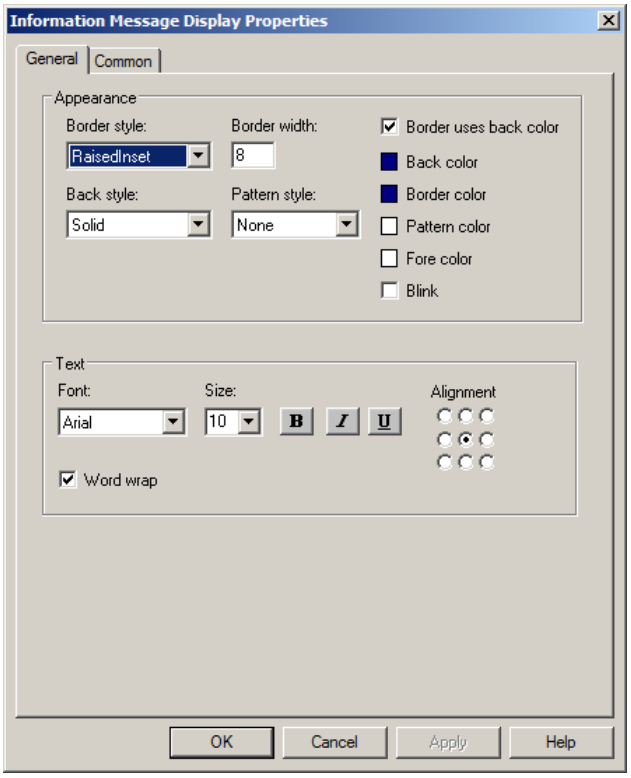
The information message display graphic object gives the operator runtime messages about information that requires immediate attention.

FactoryTalk View comes with a default graphic display called [INFORMATION] that contains an information message display object. You can use the display and object as is, customize them, or create your own.

For more information about using information message displays, see How the information message display graphic object works on page 532.

To set up an information message display

1. Double-click the information message display.



2. In the object's **Properties** dialog box, fill in the options on each tab:

   - In the **General** tab, specify what the information message display looks like at run time.
   - In the **Common** tab, specify the information message display's spacial properties, name, and visibility.

   For details about the options in the tabs, see Help.

3. When you are finished, click **OK**.

Animate graphic objects

This chapter describes:

- The types of animation and which objects support which types of animation
- Use the **Animation** dialog box
- Test animation
- Use tag names, tag placeholders, and expressions when attaching animation
- Set the minimum and maximum values for animation that uses a range of motion
- Use **Object Smart Path** to define an object's range of motion
- Set up each type of animation
- Apply animation to groups
- Check what kind of animation is attached to an object
- Copy and paste animation
- Set up animation for global objects

Types of animation

Animation associates graphic objects with tags so the appearance or position of an object changes to reflect changes to the tag's value. For example, an object's color could change from yellow to orange to red as the tag's value increases. Or a slider could move from left to right as a tag's value increases.

You can use these types of animation:

- Color
- Fill
- Height
- Horizontal position
- Horizontal slider
- Rotation
- Vertical position
- Vertical slider

- Visibility
- Width

The Objects 5 Screen Demo sample application contains many examples of animation. In particular, see the graphic displays called *Animation I* and *Animation II*.

Which objects can have which types of animation?

This table summarizes which types of objects support which types of animation. For information about the different types of graphic objects, see Types of graphic objects on page 331.

These objects	Support these types of animation
Drawing objects, except images, panels, and rounded rectangles	All types
Rounded rectangles	All types except rotation
All other objects	Visibility

You can also attach animation to groups of drawing objects. For more information, see Apply animation to groups on page 471.

You can attach as many types of animation to a drawing object (except images and panels) as you like. For example, apply width, height, horizontal position, and vertical position animation to an object to give it the appearance of moving into or out of the display as it shrinks and grows.

Use the Animation dialog box

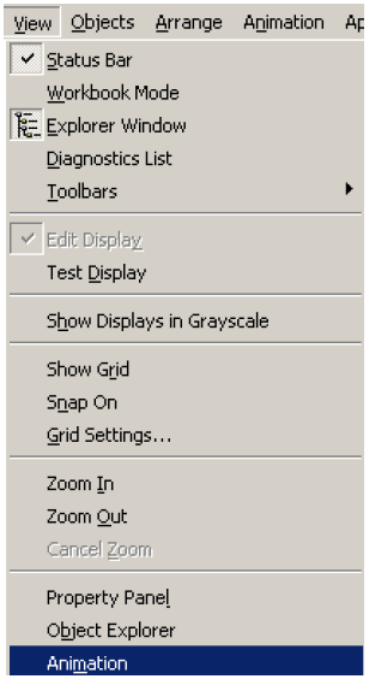
To attach animation, use the **Animation** dialog box.

To open the Animation dialog box, do one of the following

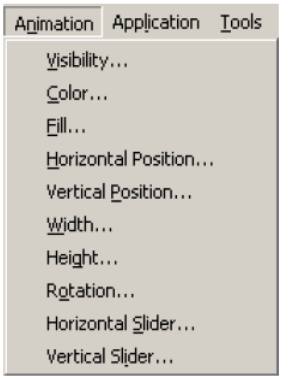
- Select an object, and then on the View menu click **Animation**.
- Select an object, and then from the **Animation** menu, select an animation type. Animation types that are not supported for the selected object are unavailable.

- Right-click an object, select Animation, and then click an animation type. Animation types that are not supported for the selected object are unavailable.

View menu

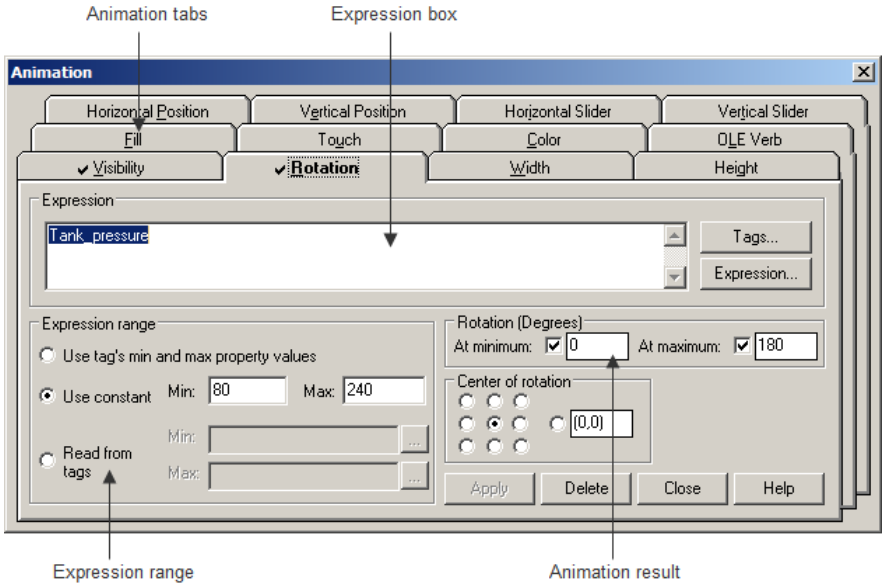


Animation menu



About the Animation dialog box

The **Animation** dialog box is a floating dialog box, which means you can keep it open all the time and move it around the screen. While it's open you can select other objects and open other dialog boxes.



For details about the parts of the **Animation** dialog box, see Help.

Use Object Smart Path to visually set animation

Because the **Animation** dialog box stays open, you can go back and forth between the dialog box and the graphic display. This makes it easy to set the range of motion for an object because you do not have to know how many pixels you want an object to move. Instead, you can set the range of motion visually using the **Object Smart Path** feature. For details, see Use Object Smart Path on page 463.

Test animation

To test the animation you have set up in a graphic display, use the Test Display tool to switch to test mode. When you are finished testing, switch back to edit mode to continue editing.

To switch between test and edit modes

- From the **View** menu, select **Test Display** or **Edit Display**, or click the Test Display tool , or the Edit Display tool .

Note: Test mode is not the same as running the display. Test mode does not change the appearance or position of the display as set up in the **Display Settings** dialog box. Also, data logging is not turned on in test mode.

Use tag names and tag placeholders

When setting up animation for objects, you are linking objects to tags. You can specify a tag name or use tag placeholder.

You can use HMI tags or data server tags that already exist, or you can use a new tag name.

Tag placeholders allow you to create displays that can be used with different tags.

You can use tag placeholders in:

- The graphic display that opens when the application is first run.
- Graphic displays that are opened using a Goto display button.
- Graphic displays that are opened using a display list selector.
- The graphic display that opens when the logout button is pressed.
- The graphic display that opens when auto logout is used.
- Graphic displays that are opened using the **Remote Display Number** global connection.

Use parameter files or parameter lists to specify which tags or folders to substitute for which placeholders. For global objects, you can specify the tags or folders of tags using global object parameters. For more information about using parameter files, parameter lists, and global object parameters, see Use parameters and global objects on page 501.

The tag placeholder can replace any part of a tag name, including folder names. For example, you could create a parameter file specifying that the tag placeholder #1=Folder1. You could assign the folder and a tag name to a graphic object's connection: #1\Tag1.

To create a tag placeholder

- In the **Expression** box, type the cross-hatch character followed by a number (no space in between). For example, #1.

Use expressions

Many types of animation can be achieved using expressions. You can use expressions containing tag values, constants, mathematical equations, security functions, and if-then-else logic. A tag name or tag placeholder can be included as part of an expression, or it can stand alone as the entire expression.

For more information about expressions, see Use expressions on page 475.

Set minimum and maximum values

Many types of animation require a minimum and maximum range for the tag or expression. These values determine the start and end points for a range of motion.

For example, if you specify a minimum of 0 and a maximum of 100, the object will not react to values outside of this range. So, even if the expression has a value of 200, the object does not change from its At maximum position.

When setting up animation, select one of these methods for calculating the minimum and maximum values:

- **Use tag's min and max property values** — select this method to use the minimum and maximum values of the first HMI tag in the expression. If more than one HMI tag is used in the expression, the first HMI tag's minimum and maximum values are used.

  For analog HMI tags, the values are taken from the Minimum and Maximum boxes in the **Tags** editor. For digital tags, the minimum is 0 and the maximum is 1.

- **Use constant** — select this method to use numeric constants. Type the minimum and maximum values in the boxes.
- **Read from tags** — select this method to read two tags' values to determine the minimum and maximum values. Type the tag names in the boxes, or click the Browse buttons to open the **Tag Browser** and select the tags.

  If you use this method, the tags are read when the graphic display opens. Their values at that time are used for the minimum and maximum values. The tags are not read again after this.

Define a range of motion

To define a range of motion for an object, do one of the following:

- Use the mouse to move the object in the display. This uses the **Object Smart Path** feature to visually define the range of motion.
- Type values in the **At minimum** and **At maximum** boxes.

Motion can be defined in pixels, percentages, or degrees.

Animation that does not use a range of motion

Visibility and color animation do not use a range of motion, because these types of animation represent a change of state, not a range of values.

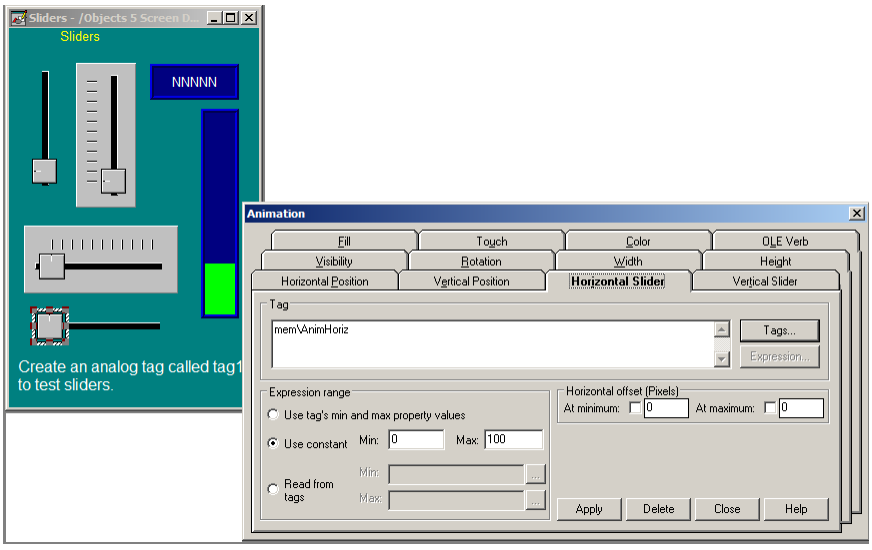
Use Object Smart Path

With **Object Smart Path**, you can easily set the range of motion for an object. The following example shows how **Object Smart Path** works.

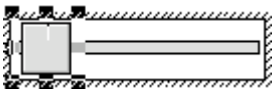
Example: Use Object Smart Path to define the range of motion for horizontal slider animation

To define a range of motion for a slider object

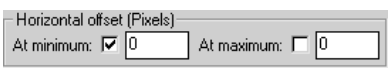
1. In the **Graphics** editor, create a slider object using a line and a rectangle, or copy a slider object from the Sliders graphic library.
2. Open the **Animation** dialog box and click the **Horizontal Slider** tab.
3. In the display, select the rectangle in the slider object.
4. In the **Tag** box of the **Animation** dialog box, specify a tag name.



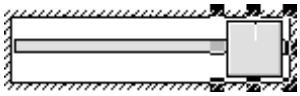
5. In the display, drag the rectangle to the position that will indicate the lowest number in the range.



6. In the **Animation** dialog box, set this position by clicking the **At minimum** check box.



7. In the display, drag the rectangle to the position that will indicate the highest number in the range.



8. In the **Animation** dialog box, set this position by selecting the **At maximum** check box.

9. To save the settings, click **Apply**.

When you finish setting up the animation, the rectangle returns to its original position.

Set up the different types of animation

This section describes the different types of animation and provides tips and examples for setting up animation.

Set up visibility animation

With visibility animation, an object becomes visible or invisible based on a tag value or the result of an expression.

If an object is invisible, it is inactive.

Visibility animation is available for all objects. Visibility animation overrides an object's Visible property.

Note: If you use a tag's value to control visibility animation as well as in an expression to control some other aspect of animation, when you set up visibility, set the Expression true state to **Invisible**. If you do not do this, the object could appear briefly in its design-time location and orientation before animating properly.

For more information about setting up visibility animation, see Help.

Example: Use visibility animation to set up security for a graphic display

This example shows how to use visibility animation to control what operators can see. In a graphic display that all users have access to, only the Admin user can see the graphic object to which this animation is attached.

This example uses the security function CurrentUserName( ). The function returns the string value of the Account ID (user name) for the user who is currently logged in.

The CurrentUserName( ) function is case sensitive. All user names use uppercase letters, so make sure that you use uppercase letters in your expression.

To specify which user can view an object in a display

1. Select the object to limit visibility to.
2. Open the **Animation** dialog box and click the **Visibility** tab.
3. In the **Expression** box, type this:

   ```
   CurrentUserName( ) == "ADMIN"
   ```

4. For the **Expression true state**, select **Visible**.
5. Click **Apply**, and then click **Close**.

At run time, the object is visible only if the Admin user is logged in.

Set up color animation

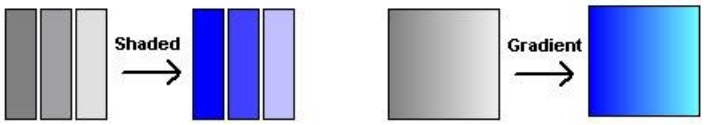
With color animation, an object changes color based on a tag value or the result of an expression. You can specify up to 16 color changes (A to P) for any object. Colors can be solid or blinking. For each color change, specify the value or threshold at which the color is to change and specify the colors to change to. At run time, when the value reaches or crosses the threshold, the color changes.

Choosing between **Solid**, **Gradient**, **Original**, and **Shaded** fill styles allows for more animation options for the blinking object.

- **Solid** - Allows you to change the colors, and they will have a solid look to them.
- **Gradient** - Allows you to change the colors, and they will have a gradient look to them. If you select **Gradient** as the **Fill Style**, the **Fill color** box changes to gradient. Click it to bring up the gradient fill dialog box to configure the gradient fill.
- **Original** - Retains the colors and the shading of the object as it was imported. Both the line and fill color can be altered from the original using Blink.
- **Shaded** - Uses a tight dot pattern to soften or give a shaded appearance. This fill style takes effect only on the group object that is composed of individual objects with dark to light colors, such as the Symbol Factory objects.

Note: Some types of graphics are made up of many elements. An individual element can be selected and have color animation applied just to it.

The following example shows the effects of Shaded and Gradient fill styles.



Color animation is available for all drawing objects except images and panels.

Keep Original Color

Using the **Original Fill Style** allows for more variations on animating an object. Instead of a specific color for the object's non-blink state, the object's original color can be used.

If **Original** is used as a **Fill Style** on any state, the color palette boxes will not allow a color change. By selecting the Blink option, a different color can be used for both the Line and the Fill color or individually.

Control Color Shading

Using the **Shaded Fill Style** along with the **Blink** option allows control of the shading aspect of a display object by changing combinations of **Line** and **Fill** and different colors.

For more information about setting up color animation, see Help.

Example: Create a text object that blinks

This example describes how to create a text object that constantly blinks between two colors. Since the blinking is not based on changes in tag values, the expression is simply a constant value that matches the value for the selected threshold.

For details about creating text, see Create text on page 343.

1. Select the text object.
2. Open the **Animation** dialog box, and then click the **Color** tab.
3. In the Expression box, type 0.

   Zero is the default value for threshold A.

4. In the list box, click threshold A. (Leave the value in the Value box as 0.)

5. For the line color, click **Blink**. (If desired, click Blink for the fill color too.)

6. For each color, click the color box, and then click the color to use.

7. Click **Apply**.

Example: Create an object that changes color as the fill level changes

This example describes how to create a rectangle object that changes color as the object's fill level increases. This example uses a tag called Hopper1\FlourLevel. The tag has a range of 1 to 100. When the flour level reaches 80, the rectangle blinks between gray and yellow to warn the operator that the hopper is nearly full. When the flour level reaches 95, the rectangle blinks between gray and red.

You could use a bar graph object (without animation) to achieve a similar result.

1. Double-click the rectangle to open the **Polygon Properties** dialog box. Assign these properties to the rectangle:

   - In the **Back style** box, select **Solid**.
   - For the **Fore color** and **Back color**, select **gray**.

2. Click **OK** to close the **Polygon Properties** dialog box.

3. With the rectangle selected, open the **Animation** dialog box, and then click the **Fill** tab.

4. Attach fill animation as follows:

   - In the **Expression** box, type *Hopper1\FlourLevel* (this is the tag that monitors the fill level).
   - For **Fill Direction**, click **Up**.

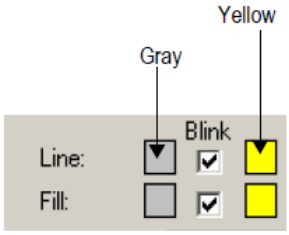
5. Click the **Color** tab, and then attach color animation as follows:

   - In the **Expression** box, type *Hopper1\FlourLevel* (the same tag that was used in the **Fill** tab).

6. Set up the color for the normal state

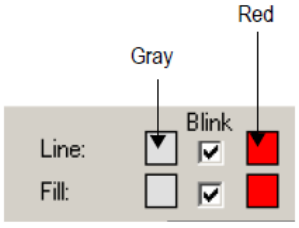
- In the **List** box, select **A**. (In the **Value** box, leave the value as 0.)
- For **Fill Style**, select **Solid**.
- For **Line** and **Fill**, select the color box, and then select gray (the same gray used for the rectangle).

7. Set up the color for the first warning
   - In the **List** box, select **B**.
   - In the **Value** box, type *80*.
   - For **Line** and **Fill** colors, select **Blink**. A palette box will be shown for the **Blink** color.



   - For the line colors, select gray for the first color and yellow for the blink color. Repeat for the fill colors.

8. Set up the **color** for the second warning
   - In the **List** box, select **C**.
   - In the **Value** box, type *95*.
   - For the **Line** and **Fill**, select **Blink**. A palette box will be shown for the **Blink** color.



   - For the line colors, select gray for the first color and red for the blink color. Repeat for the fill colors.

9. Click **Apply**.

Set up fill animation

With fill animation, the level of fill in an object is based on a tag value (or the result of an expression) in relation to the specified minimum and

maximum values. For example, if the value of the expression is halfway between the minimum and maximum values, the object will be half full.

Fill animation is available for all drawing objects (including group objects) except images and panels.

If you select the **Inside Only** check box, fill animation does not affect objects' borders, line objects, or objects with transparent backgrounds.

For more information about setting up fill animation, see Help.

Set up horizontal position animation

With horizontal position animation, an object moves horizontally based on a tag value (or the result of an expression) in relation to the specified minimum and maximum values. For example, if the value of the expression is halfway between the minimum and maximum values, the object will be halfway between its minimum and maximum pixel offset.

Horizontal position animation is available for all drawing objects except images and panels.

For more information about setting up horizontal position animation, see Help.

Set up vertical position animation

With vertical position animation, an object moves vertically based on a tag value (or the result of an expression) in relation to the specified minimum and maximum values. For example, if the value of the expression is halfway between the minimum and maximum values, the object will be halfway between its minimum and maximum offset.

- To move an object on the display "up", a negative offset number is required. The top-left corner of the display has the coordinates of 0,0.

Vertical position animation is available for all drawing objects except images and panels.

For more information about setting up vertical position animation, see Help.

Set up width animation

With width animation, an object's width changes based on a tag value (or the result of an expression) in relation to the specified minimum and maximum values. For example, if the value of the expression is halfway between the

minimum and maximum values, the object's width will be halfway between its minimum and maximum percentage.

Width animation is available for all drawing objects except images and panels.

For more information about setting up width animation, see Help.

Set up height animation

With height animation, an object's height changes based on a tag value (or the result of an expression) in relation to the specified minimum and maximum values. For example, if the value of the expression is halfway between the minimum and maximum values, the object's height will be halfway between its minimum and maximum percentage.

Height animation is available for all drawing objects except images and panels.

For more information about setting up height animation, see Help.

Set up rotation animation

With rotation animation, an object rotates around an anchor point based on a tag value (or the result of an expression) in relation to the specified minimum and maximum values. For example, if the value of the expression is halfway between the minimum and maximum values, the object will rotate half the specified amount.

Rotation animation is available for all drawing objects except images, panels, and rounded rectangles. If you apply rotation animation to text, the text rotates around the anchor point but remains in the upright position.

For more information about setting up rotation animation, see Help.

Set up horizontal slider animation

With horizontal slider animation, you can use a drawing object to set the value of a tag. To do this, define a path for the object. At run time, when the operator moves the object horizontally (using a mouse), the pixel position of the object is translated into values that are written to the tag. If the tag value is changed externally, the position of the slider changes as well.

An object can have both vertical and horizontal slider animation.

Horizontal slider animation is available for all drawing objects except images and panels.

For more information about setting up horizontal slider animation, see Help.

Tips

Here are some tips for creating slider objects:

- The Sliders graphic library contains several slider objects you can drag and drop into your graphic displays. Attach slider animation to the button portion of the slider object.
- If you create your own slider object, it's useful to draw an object (for example, a line) to represent the path the slider will move along.

Set up vertical slider animation

With vertical slider animation, you can use a drawing object to set the value of a tag. To do this, define a path for the object. At run time, when the operator moves the object vertically (using a mouse), the pixel position of the object is translated into values that are written to the tag. If the tag value is changed externally, the position of the slider changes as well.

An object can have both vertical and horizontal slider animation.

- To move an object on the display "up", a negative offset number is required. The top-left corner of the display has the coordinates of 0,0.

Vertical slider animation is available for all drawing objects except images and panels.

For tips about creating slider objects, see the previous section.

For more information about setting up vertical slider animation, see Help.

Apply animation to groups

You can apply animation to objects and then group those objects and apply animation to the group. When the display is running, animation is applied as follows:

These types of animation	Are applied like this
Color	Animation attached to individual objects within the group overrides group animation.
Fill	Animation results for both the individual objects and the group are applied.
Horizontal slider, vertical slider	Group animation overrides animation attached to individual objects within the group.

These types of animation	Are applied like this
Height, width, horizontal position, vertical position, and rotation	Animation results for individual objects and the group are combined. For example, if an individual's horizontal position animation result is to offset the object by 100 pixels, and the group's result is to offset the group by 200 pixels, the individual object is offset by 300 pixels.
Visibility	When the group's animation visibility is **False** (the group is not visible), then no objects in the group are visible, regardless of the animation status of the individual objects. When the group's animation visibility is True (the group is visible), the visibility of an object within the group is determined by the individual object animation.

Test your animation to ensure you achieve the intended results.

To apply animation to objects within groups, use the group edit feature. For details, see Edit groups of objects on page 379.

Check the animation on objects

To see what type of animation has been set up for an object or group of objects, use the Object Explorer, the Animation menu, or the **Animation** dialog box.

For information about using the Object Explorer to highlight objects that have animation attached, see Highlight objects in the Object Explorer on page 357.

To see what type of animation has been set up for objects within a group, use the group edit feature or the Object Explorer. For information about using the group edit feature, see Edit groups of objects on page 379.

To view the animation on an object using the Animation menu

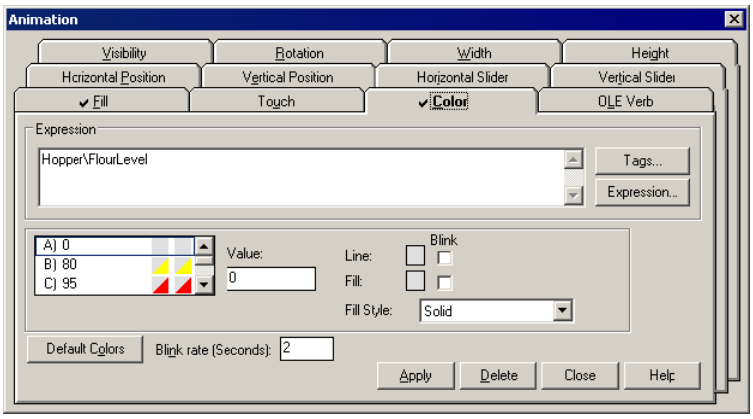
1. Select an object.
2. View the animation by doing one of the following:
   - Click the **Animation** menu and see which items have a check mark.
   - Right-click the object and then select **Animation** to see which items have a check mark.

To view the animation on an object using the Animation dialog box

1. Select an object.

2. From the **View** menu, select **Animation**.

   When the **Animation** dialog box opens, look at which tabs have check marks on them to see which types of animation have been set up.



Copy or duplicate objects with animation

You can copy or duplicate objects that have animation attached to them. When you do, the animation attached to the objects is also copied or duplicated. If you copy or duplicate a group, the copy of the group can be ungrouped to individual objects, just like the original.

For information about copying and duplicating objects, see pages 20-43 on page 372 and 20-45 on page 374.

Copy animation without copying objects

If you have attached animation to an object, you can copy the animation and paste it onto another object. If the object has more than one type of animation, all animation is copied and pasted. Note that you can only copy animation to an object that supports the same type of animation.

To copy and paste animation

1. Select the object that has the animation you want to copy.
2. From the **Edit** menu, select **Copy Animation**, or right-click the object and then select **Copy Animation**.
3. Select the objects to copy the animation to.
4. From the **Edit** menu, select **Paste Animation**.

   To paste to a single object, you can right-click the object and then select **Paste Animation.**

Set up animation for global objects

FactoryTalk View global objects allow you to link the appearance and behavior of a graphic object to multiple copies of that object. When the original base object is updated, the changes are automatically applied to all the copies of the object. For information about creating base objects, see Use global objects on page 509.

The copies of the object are called reference objects, and they have the same properties as the original base object. If desired, you can assign unique animation to the reference object. For information about creating reference objects, see Create reference objects on page 511.

The **LinkAnimation** property determines whether the reference object uses the base object's animation.

To set up animation for a reference object

1. Double-click the reference object to open the **Property Panel**.
2. Select the **LinkAnimation** property setting to use:
   - **Do not link** — allows you to set up separate animation for the reference object.
   - **Link with expressions** — the reference object uses the animation and tags or expressions assigned to the base object.
   - **Link without expressions** — allows you to use only the types of animation set up for the base object, but assign different tags or expressions to the reference object.
3. If you selected **Do not link**,or **Link without** expressions, set up animation for the object using the methods described in this chapter.

For more information about setting up link properties and working with reference objects, see Set up reference objects' link properties on page 513.

Use expressions

This chapter describes:

- The types of expression components
- Use the **Expression** editor
- Which editors use expressions
- Format expressions
- Use tag names and tag placeholders with expressions
- Use constants
- Use operators
- Use math, security, and language functions
- Use if-then-else logic in expressions
- The evaluation order of operators
- Use write expressions

About expressions

Sometimes the data you gather from devices is meaningful only when you:

- Compare it to other values.
- Combine it with other values.
- Create a cause-effect relationship with other values.

Expressions allow you to create mathematical or logical combinations of data that return more meaningful values. Depending on the components used in the expression, the value returned can be in the form of a numeric value, a true/false value, or a text string.

Expressions that result in floating-point values

If an expression results in a floating-point value but an integer value is required, the floating-point value is rounded.

For information about how values are rounded, see How values are rounded on page 98.

Expression components

Expressions can be built from:

- Tag values
- Tag placeholders
- Constants
- Arithmetic, relational, logical, and bitwise operators
- Mathematical and security functions
- If-then-else logic

Tags, arithmetic operators, bitwise operators, and mathematical functions such as SQRT (square root) return numeric values.

Relational and logical operators return true/false values. The security function CurrentUserHasCode(*x*) also returns a true/false value.

The security function CurrentUserName( ) returns a string value. The language function CurrentLanguage( ) returns a string value.

Expressions that use if-then-else logic can return numeric values, true/false values, or text strings, depending on how they are structured. These are called conditional expressions because the result of the expression depends on whether the If statement is true or false. When the If statement evaluates to true, the result is defined by the Then statement. When the If statement is false, the result is defined by the Else statement.

The Objects 5 Screen Demo sample application contains many examples of expressions. For example, see the alarm trigger expressions in the **Alarm Setup** editor.

Use the Expression editor

To create an expression, you can:

- Type it directly in the **Tag or expression** column, for any connection that accepts expressions, or in the **Expression** box (for animation).
- Open the **Expression** editor, and then create the expression in the editor.

Use the Expression editor versus typing expressions directly

Once you are familiar with expression syntax, you might find it quicker to create short expressions by typing them directly in the **Tag or expression** column.

The **Expression** editor allows you to see more text at once, which is useful for longer, more complicated expressions. Also, you can click buttons to enter tag names, operators, and functions, thus avoiding typing mistakes. Another advantage of using the **Expression** editor is that you can check whether the syntax of the expression you have created is valid.

To create an expression by typing it directly

- Type an expression up to 16,000 characters long.

Expressions that you type directly are not checked for syntax.

To open the Expression editor, do one of the following

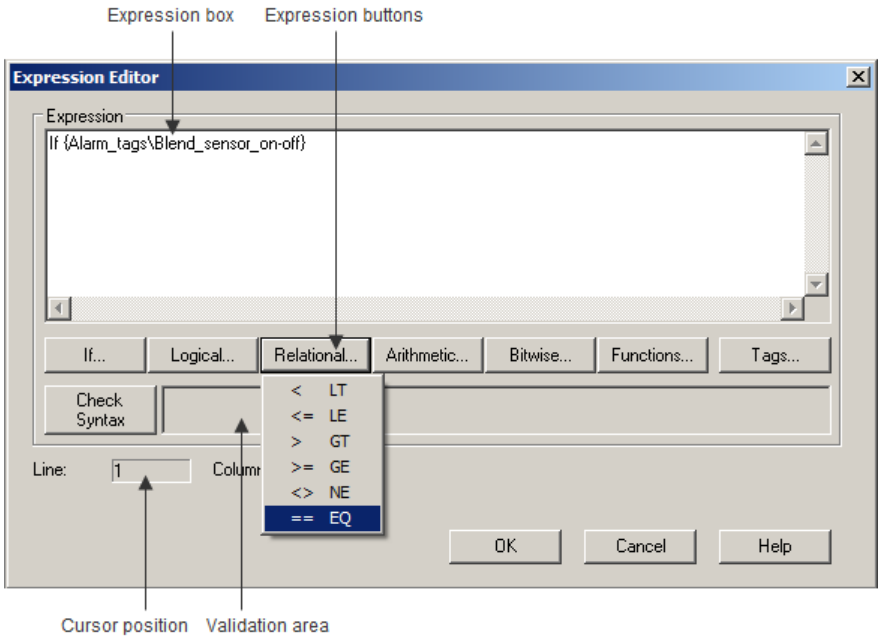
- Click the **Browse** button in the **Exprn** column

for a connection that accepts expressions.

  The **Browse** button is not available for connections to which you can assign only tags.

- In the **Animation** dialog box, click the **Expression** button.

The **Expression** editor has these parts:



For details about using the options in the **Expression** editor, see Help.

Where you can use expressions

You can use expressions in these editors:

- **Graphics** — You can define an expression to control various aspects of a graphic object's appearance. For more information about

assigning expressions to graphic objects, see Use expressions to manipulate tag values on page 367.

You can also use expressions to attach animation to graphic objects. For more information, see Animate graphic objects on page 457.

- **Global Connections** — You can use expressions to remotely control when to open and print displays, as well as the date and time to show. For more information, see Set up global connections on page 111.
- **Alarm Setup** — When setting up alarms, you can use expressions for alarm triggers, and with some of the connections that silence and acknowledge alarms. For more information, see Set up alarms on page 119.
- **Information Setup** — You can use expressions to determine when to show information messages. For more information, see Use information messages on page 525.
- **Macros** — You can use expressions in macros to assign values to tags. For more information, see Use macros to assign values to tags on page 561.

Format expressions

You can format expressions so they are easier to read. However, do not let tag names, function names, or function arguments span more than one line.

When formatting expressions, you can use line returns and multiple spaces.

Enclose strings in quotes. The string can contain any character, and can include spaces.

Example: Format an expression

To format this if-then-else statement, you can align the Else with the appropriate If, so the logic is easy to understand:

```
if (tag1 > tag2) then 0
else if (tag1 > tag3) then 2
else 4
```

Or you can condense it to the following:

```
if (tag1 > tag2) then 0 else if (tag1 > tag3) then 2 else 4
```

Use tag names and tag placeholders

A tag name can be included as part of an expression or can stand alone as the entire expression.

To supply a tag name, do one of the following:

- Type a tag name.

You can type a tag name that does not exist in the tag database. When you click OK, you are prompted to create the tag. You can create it now, or write down the name and create it later.

- Click the **Tags** button and select a tag from the **Tag Browser**.

Enclose tag names that contain dashes or start with a number in braces { } when you use them in an expression. This distinguishes the characters in the tag name from the characters in the expression.

You can use string tags as operands with the plus (+) arithmetic operator and with the relational operators.

Use tag placeholders instead of tag names

The **Graphics** editor accepts tag placeholders instead of tag names. Placeholders allow you to use the same display with different sets of tags.

You can use tag placeholders in:

- The graphic display that opens when the application is first run.
- Graphic displays that are opened using a Goto display button.
- Graphic displays that are opened using a display list selector.
- The graphic display that is opened by a logout button.
- The graphic that is opened when auto logout is used.
- Graphic displays that are opened using the **Remote Display Number** global connection.

Use parameter files to specify which tags or folders to substitute for which placeholders. For global objects, you can specify the tags or folders of tags using global object parameters. For more information about using parameter files and global object parameters, see Use parameters and global objects on page 501.

The tag placeholder can replace any part of a tag name, including folder names. For example, you could create a parameter file specifying that the tag placeholder #1=Folder1. You could assign the folder and a tag name to a graphic object's connection: #1\Tag1.

To create a tag placeholder in an expression

- Type the cross-hatch character followed by a number (no space in between). For example, #1.

Constants

A constant can have any of the following formats:

- Integer (123)
- Floating-point (123.45)
- String constant ("character string")

Arithmetic operators

Arithmetic operators perform math on two or more numeric values and calculate the result. The arithmetic operators are:

Symbol	Operator	Example (For these examples, tag1 = 5 and tag2 = 7)
+	addition	tag1 + tag2 returns a value of 12 You can also use this operator with string operands. See String operands on page 480.
-	subtraction	tag1 - tag2 returns a value of -2
*	multiplication	tag1 * tag2 returns a value of 35
/	division	tag1 / tag2 returns a value of 0.7142857
MOD,%	modulus (remainder)	tag2 MOD tag1 returns a value of 2 The modulus operator is the remainder of one number divided by another. In the example, the remainder of 7 divided by 5 is 2; so 7 % 5 = 2 **Important**: This operator is for integers only, not floating-point numbers.
**	exponent	tag1 ** tag2 returns a value of 78125

Note: Be sure that any tag value you use as a divisor cannot at some point have a value of zero. Expressions that attempt to divide a number by zero produce an error at run time.

String operands

The + operator can be used to join string operands. For example, the expression "hello" + "world" returns: helloworld.

You cannot join string tags to analog tags, whether they are HMI or data server tags.

Relational operators

Relational operators compare two numeric or string values to provide a true or false result. If the statement is true, a value of 1 is returned. If false, 0 is returned.

The relational operators are:

Symbols	Operator	Numeric Example	String Example
For the numeric examples, tag1 = 5 and tag2 = 7 For the string examples, serial_no = "ST009"			
EQ, ==	equal	tag1 == tag2 false	serial_no == "ST009" true
NE, <>	not equal	tag1 <> tag2 true	serial_no <> "ST011" true
LT, <	less than	tag1 < tag2 true	serial_no < "ST011" true
GT, >	greater than	tag1 > tag2 false	serial_no > "ST011" false
LE, <=	less than or equal to	tag1 <= tag2 true	serial_no <= "ST011" true
GE >=	greater than or equal to	tag1 >= tag2 false	serial_no >= "ST011" false

How string operands are evaluated

String operands are evaluated by case and by alphabetical order. Lower case letters are greater than upper case letters. For example, h is greater than H. Letters later in the alphabet are greater than those earlier in the alphabet. For example, B is greater than A.

Logical operators

Logical operators determine the validity of one or more statements. There are three logical operators: AND, OR, and NOT. The operators return a non-zero value if the expression is true, or a 0 if the expression is false.

Any statement that evaluates to a non-zero value is regarded as true. For example, the statement tag1 is false if the value of tag1 is 0, and true if tag1 has any other value.

The logical operators are:

Symbols	Operator	Action	Example (For these examples, tag1 = 5 and tag2 = 7)
AND, &&	and	Returns a 1 if the statements to the right and left of the operator are both true.	(tag1 < tag2) AND (tag1 == 5) Both statements are true; returns a 1.
OR, ||	or	Returns a 1 if either the statement to the left or right of the operator is true.	(tag1 > tag2) OR (tag1 == 5) tag1 == 5 is true; returns a 1.
NOT	negation	Reverses the logical value of the statement it operates on.	NOT (tag1 < tag2) Although tag1 < tag2 is true, NOT reverses the logical value; returns a 0.

Note: The parentheses are essential in the above expressions. They determine the evaluation order of the operators. For more information, see Evaluation order of operators on page 484.

Bitwise operators

Bitwise operators examine and manipulate individual bits within a value.

Important: These operators are for integers only, not floating-point numbers. Do not use them with tags or expressions that return floating-point values.

Symbol	Operator	Action
&	And	Compares two integers or tags on a bit-by-bit basis. Returns an integer with a bit set to 1 if both the corresponding bits in the original numbers are 1. Otherwise, the resulting bit is 0.
|	inclusive OR	Compares two integers or tags on a bit-by-bit basis. Returns an integer with a bit set to 1 if either or both of the corresponding bits in the original numbers are 1. If both bits are 0, the resulting bit is 0.
^	exclusive OR (XOR)	Compares two integers or tags on a bit-by-bit basis. Returns an integer with a bit set to 1 if the corresponding bits in the original numbers differ. If both bits are 1 or both are 0, the resulting bit is 0.

Symbol	Operator	Action
>>	right shift	Shifts the bits within an integer or tag to the right. Shifts the bits within the left operand by the amount specified in the right operand. The bit on the right disappears. Either a 0 or a 1 is shifted in on the left, depending on whether the left-most bit is a 0 or a 1, and whether the operand consists of a signed or unsigned data type. For signed data types, if the left-most bit is 0, a 0 is shifted in. If the left-most bit is 1, a 1 is shifted in. In other words, the sign of the number is preserved. For unsigned data types, a 0 is always shifted in.
<<	left shift	Shifts the bits within an integer or tag to the left. Shifts the bits within the left operand by the amount specified in the right operand. The bit on the left disappears and 0 always shifts in on the right. See Use the left shift operator on page 483.
~	complement	Returns one's complement; that is, it toggles the bits within an integer or tag. Reverses every bit within the number so every 1 bit becomes a 0 and vice versa.

Use the left shift operator

If the left bit is a 1 an overflow occurs, and an error message is generated. To prevent this, use the bitwise AND operator with the left shift operator in an expression. For example:

(dev << 1) & 65535

where dev is a tag whose value is being shifted left, and 65535 is 1111 1111 1111 1111 in binary form.

Examples: Bitwise operators

For these examples, tag1 = 5 (binary 0000 0000 0000 0101) and tag2 = 2 (binary 0000 0000 0000 0010)

tag1 & tag2
Returns 0 (binary 0000 0000 0000 0000).

tag1 | tag2
Returns 7 (binary 0000 0000 0000 0111).

tag1 ^ tag2
Returns 7 (binary 0000 0000 0000 0111).

tag1 >> 1
Returns 2 (binary 0000 0000 0000 0010).

tag1 << 1
Returns 10 (binary 0000 0000 0000 1010).

~ tag1
Returns -6 (binary 1111 1111 1111 1010).

Evaluation order of operators

Expressions with more than one operator are evaluated in this order:

- Operators in parentheses are evaluated first.

1. Therefore, to change the order of precedence, use parentheses.

- The operator with the highest precedence is evaluated next.
- When two operators have equal precedence, they are evaluated from left to right.

Operators are evaluated in this order:

Evaluation order	Symbols
1 (highest)	( )
2	NOT ~
3	* / MOD, % ** AND, && & >> <<
4	+ - OR, || | ^
5 (lowest)	EQ, == NE, <> LT, < GT, > LE, <= GE, >=

Examples: Evaluation order

For these examples, tag1 = 5, tag2 = 7, and tag3 = 10.

(tag1 > tag2) AND (tag1 < tag3)

is evaluated in this sequence:

1. tag1 > tag2 = 0
2. tag1 < tag3 = 1
3. 0 AND 1 = 0

The expression evaluates to 0 (false).

---

tag1 > tag2 AND tag3

is evaluated in this sequence:

1. tag2 AND tag3 = 1
2. tag1 > 1 = 1

The expression evaluates to 1 (true).

NOT tag1 AND tag2 > tag3 ** 2

is evaluated in this sequence:

1. NOT tag1 = 0
2. 0 AND tag2 = 0
3. tag3 ** 2 = 100
4. 0 > 100 = 0

The expression evaluates to 0 (false).

Mathematical functions

Use math functions to calculate the square root, log (natural or base 10), or trigonometry ratios (in radians or degrees) of a tag.

This function	Returns this value
SQRT (expression)	The square root of the expression
LOG (expression)	The natural log of the expression
LOG10 (expression)	The base ten log of the expression
SIN (expression)	The sine of the expression in radians

This function	Returns this value
COS (expression)	The cosine of the expression in radians
TAN (expression)	The tangent of the expression in radians
ARCSIN (expression)	The arc sine of the expression in radians
ARCCOS (expression)	The arc cosine of the expression in radians
ARCTAN (expression	The arc tangent of the expression in radians
SIND (expression)	The sine of the expression in degrees
COSD (expression)	The cosine of the expression in degrees
TAND (expression)	The tangent of the expression in degrees
ARCSIND (expression)	The arc sine of the expression in degrees
ARCCOSD (expression)	The arc cosine of the expression in degrees
ARCTAND (expression)	The arc tangent of the expression in degrees

Security functions

Use security functions to control access to your application.

These functions allow you to determine a user's identity or security rights in order to limit access to the application based on these criteria.

This function	Returns this value
CurrentUserName( )	A string containing the name of the current user. This function is case sensitive. All RSView 3.20 and earlier user names use uppercase letters.
CurrentUserHasCode (*Security Code Letters*)	True (1) if any of the specified security codes have been assigned to the user; false (0) if not. If checking multiple security codes, do not type a space between the security code letters. For example: CurrentUserHasCode(ABP) returns the value 1 if the user has been assigned one or more of the specified codes.
CurrentUserHasGroup(*"Group Name"*)	True (1) if the current user is assigned to the specified group configured in FactoryTalk Directory; false (0) if not. This function is only supported in 8.0 and later versions of FactoryTalk ME applications. The group name must be enclosed with double quotes. For example, CurrentUserHasGroup("Group A") returns the value 1 if the user has been assigned to Group A.

For more information about setting up security for your application, see Set up security on page 175.

For an example of using the CurrentUserHasCode(*x*) function, see To assign visibility animation to the shutdown button on page 190.

For examples of using the CurrentUserName( ) function, see To assign visibility animation to the Goto display button on page 189.

Language function

The language function shows you which language your application is currently using.

You can show the current language in a string display, or use it in expressions to generate language-specific messages for your users.

This function	Returns this value
CurrentLanguage( )	RFC1766 name of the current runtime language.

The RFC1766 name is a standard way of representing a language using the format: *languagecode-Country/RegionCode*

where *languagecode* is a lowercase two-letter code and *Country*/*RegionCode* is an uppercase two-letter code.

For example, U.S. English is en-US.

For more information about setting up languages for your application, see Set up language switching on page 197. For a list of RFC1766 names, see RFC1766 names on page 601.

Language switching alarm, information, and local messages in FactoryTalk View ME Station 4.00

FactoryTalk View 5.00 and later provides direct support for switching message languages at run time.

For applications that will run in FactoryTalk View ME Station version 4.00, use the CurrentLanguage( ) expression function to specify message offsets in the information message file. In the file, divide your messages into sections for each language. To do this, set up trigger value offsets for series of messages in the **Alarm Setup** editor, information message files, and local message files.

Export the text strings in the **Alarm Setup** editor and message files for translation. Then paste the translated strings into the editor and original message files, and assign each string the correct trigger value. For information about exporting text for translation, see Set up language switching on page 197.

Example: Set up information messages in multiple languages

This example shows how to generate English, French, or German information messages at run time in an FactoryTalk View ME Station 4.00 application, depending on which language the application is using.

1. Create a tag called *Information_messages* that will generate trigger values of 11 to 20 for different conditions that require information messages.
2. Create an information message file.
3. Create English messages for trigger values 11 to 20.

   Tip: Messages are sorted alphanumerically in the Excel spreadsheet or Unicode text file created for translation. Therefore, numbers 2 through 9 would appear after 10, 11, 12, and so on. To keep your messages in order in the translation file, begin the first series of numbers at 11.

4. Create French messages for trigger values 21 to 30.
5. Create German messages for trigger values 31 to 40.
6. Assign this expression to the **Value** connection in the **Information Setup** editor:

```
If CurrentLanguage( )="en-US" then
Information_messages

Else If CurrentLanguage( )="fr-FR" then
Information_messages + 10

Else Information_messages + 20
```

If-then-else

If-then-else expressions carry out an action conditionally or branch actions depending on the statements in the expression. The if-then-else statements enable the expression to perform different actions in different situations and to repeat activities until a condition changes.

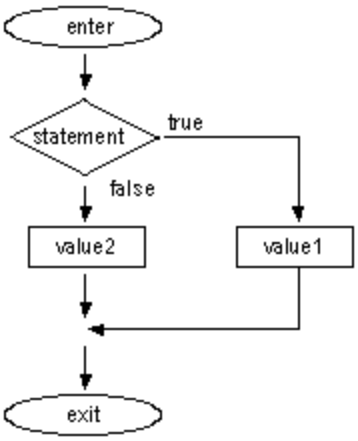
To build conditional expressions, use the relational operators and the logical operators for the statement and values.

The if-then-else structure is:

if *statement* then *value1* else *value2*

If the statement is true then the expression returns value1; if the statement is false then the expression returns value2. If the result of the statement is a non-zero value, the statement is true (and returns value1); if the result is 0, the statement is false (and returns value2).

The if-then-else structure is illustrated here.



Nested if-then-else

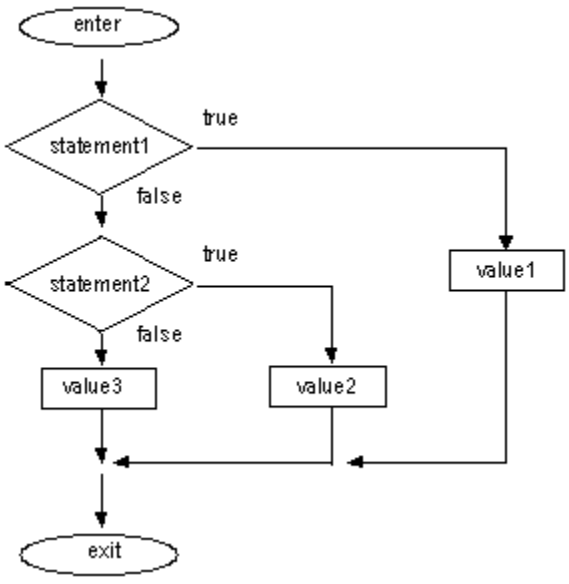
You can also nest an if-then-else structure inside the Then or Else part of an if-then-else structure.

Example 1: Nested if-then-else

This expression:

if *statement1* then *value1*
else if *statement2* then *value2*
else *value3*

has this interpretation:

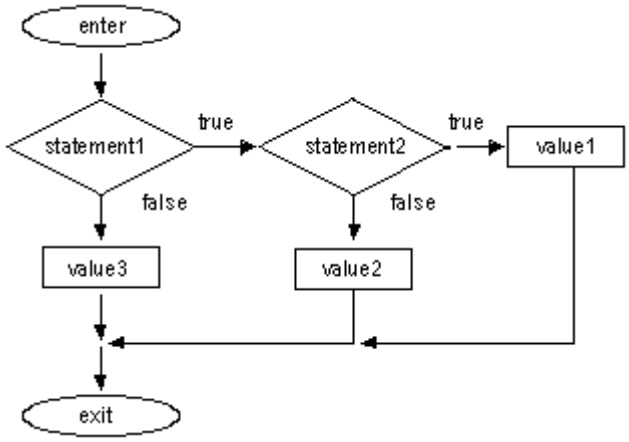


Example 2: Nested if-then-else

This expression:

if *statement1* then
if *statement2* then value1
else *value2*
else *value3*

has this interpretation:



Use write expressions

Write expressions allow the operator to enter a value which is manipulated by an expression before being sent to the data source. FactoryTalk View substitutes the value the operator enters for the placeholder in the expression, calculates the value of the expression, and writes the result to the **Value connection**. All write expressions must contain a question mark (?) as a placeholder for the value the operator enters.

You can use write expressions with the Numeric Input Enable button and the numeric input cursor point. When the operator presses the button or cursor point, a keypad or scratchpad opens. The operator enters a value in the keypad or scratchpad, and this value is substituted for the ? placeholder in the write expression.

Example: Use write expressions

In this example, the operator regulates the speed of a conveyor belt by entering a value in feet or meters per second. When the operator enters the value in meters per second, the value is converted to feet per second before being passed to the data source.

The operator first indicates whether the value is in feet or meters by pushing a Maintained pushMaintained push button. The push button has one state corresponding to feet per second, and the other state to meters per second.

Then the operator presses the Numeric Input Enable button and enters the value for the conveyor speed in a numeric pop-up keypad. The ? character in the write expression is the placeholder for the value the operator enters.

To set up the Maintained push button

1. In the **Maintained Push Button Properties** dialog box, in the **States** tab, set up these states:

   - **State 0** — Value: 0, Caption: Feet/S
   - **State 1** — Value: 1, Caption: Meters/S

2. In the **Connections** tab, assign a digital tag called Feet_or_meters to the **Value** connection (either an HMI tag or a data server tag).

To set up the Numeric Input Enable button

1. In the **Numeric Input Enable Properties** dialog box, in the **Label** tab, type the caption *Enter conveyor speed*.

2. In the **Connections** tab, assign a tag called *Conveyor_speed* to the **Value** connection.

3. Assign this expression to the **Optional Exp** connection:

   ```
   if Feet_or_meters == 0 then
   ?
   else
   ? * 3.281
   ```

FactoryTalk View writes the result of the expression to the Conveyor_speed tag at the data source.

Use embedded variables

This chapter describes:

- The types of embedded variables
- Where you can create embedded variables
- Create embedded variables
- Embedded variable syntax
- How embedded variables are updated at run time
- How embedded variables are shown at run time

About embedded variables

Embedded variables allow you to show values that change dynamically at run time. You can use embedded variables in the text captions on graphic objects, in the title bar of On Top displays, and in message text. You can use multiple embedded variables in the same caption or message.

For example, you could embed a tag value and the time variable in a local message. At run time when the local message is shown, it is updated to reflect the tag's current value as the value changes. The time is also updated as the time changes.

You can also use literal strings and constants in embedded variables, or a combination of both variable and literal strings and numbers.

Embedded variables can consist of:

- Numeric (analog or digital) tags, including both HMI and data server tags
- Literal numbers (constants)
- String tags, including both HMI and data server tags
- Literal strings (static text)
- Tag placeholders. For information about tag placeholders, see Use tag placeholders on page 501.
- The time
- The date

Where you can create embedded variables

You can create embedded variables in these editors:

- **Graphics** — Use this editor to insert embedded variables in the captions for graphic objects. For graphic objects with multiple states, you can insert different embedded variables in each state's caption.

  You can also use embedded variables in the title bar for On Top displays.

  For information about specific graphic objects, see Set up graphic objects on page 389. For information about On Top displays, see On Top displays on page 311.

- **Local Messages** — Use this editor to insert embedded variables in local messages.

  For more information about local messages, see Use local messages on page 325.

- **Information Messages** — Use this editor to insert embedded variables in information messages.

  For more information about information messages, see Use information messages on page 525.

- **Alarm Setup** — Use this editor to insert embedded variables in alarm messages.

  For more information about alarms, see Set up alarms on page 119.

Create embedded variables

To create an embedded variable in a graphic object's caption

1. Open the graphic object's **Properties** dialog box.
2. Click the tab containing the **Caption** box.

   The **Caption** box is on the **Label** tab or the **States** tab, depending on the type of object.

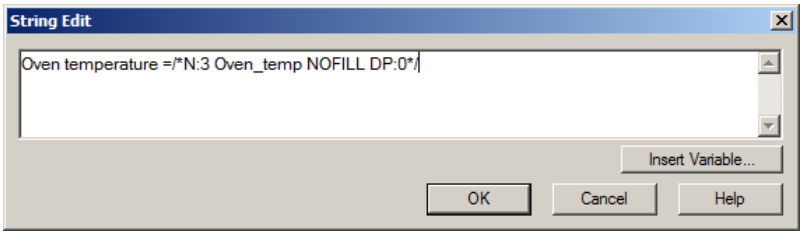
   For text objects, use the **Text** box on the **General** tab.
3. Click **Insert Variable**.
4. Click the type of variable to insert.
5. Fill in the options in the dialog box that opens. For details about the options, see Help.

To create an embedded variable in an On Top display's title bar

1. Open the **Display Settings** dialog box.
2. Select the **Title Bar** check box if it is not already selected.
3. Click **Insert Variable**.
4. Click the type of variable to insert.
5. Fill in the options in the dialog box that opens. For details about the options, see Help.

To create an embedded variable in a message

1. In the **Message** column of the **Local Messages**, **Information Messages**, or **Alarm Setup** editor, right click and then click **Edit String**.



2. Click **Insert Variable**.
3. Click the type of variable to insert.
4. Fill in the options in the dialog box that opens. For details about the options, see Help.

Embedded variable syntax

Embedded variables are case sensitive, and must use specific syntax to work. Otherwise, the embedded variable is treated as a piece of text. Therefore, we do not recommend creating and editing embedded variables manually. Instead, use the **Insert Variable** and **Edit Variable** dialog boxes.

Numeric embedded variable syntax

Use numeric embedded variables to insert analog or digital tag values into captions, title bars, and messages. You can use both HMI and data server tags.

You can also insert "literal" numbers to show a constant or to specify a tag placeholder in the caption or message.

Numeric embedded variables use this syntax:

/*LN:# *Tag_name Fill_character* DP:#*/

where

- *L* (optional) indicates it is a literal (constant) number. This symbol prevents a tag read. If you type a tag placeholder for the *Tag_name*, the value of the placeholder is substituted from the parameter file or global object parameter definition.
- *N* indicates it's a numeric embedded variable.
- # indicates the number of digits.
- *Tag_name* is the tag to show; you can also type a literal number or tag placeholder here.
- *Fill_character* is the fill character to use: NOFILL, ZEROFILL, or SPACEFILL.
- # indicates the number of decimal places.

Examples: Numeric embedded variable syntax

To show the current value of a tag called Oven_temp, with 3 digits, no decimal places, and no fill character, type this:

/*N:3 Oven_temp NOFILL DP:0*/

To show the constant 48, with 3 decimal places and 2 zeroes to the left of the number (for a total length of 8 digits including the decimal), type this:

/*LN:8 48 ZEROFILL DP:3*/

At run time the numeric embedded variable would look like this: 0048.000.

String embedded variable syntax

Use string embedded variables to insert string tag values into captions, title bars, and messages.

You can also insert "literal" strings of static text. For example, you can type a word or phrase, a tag placeholder, or a number. To control how constant numbers are shown, use a literal numeric variable rather than a string variable.

String embedded variables use this syntax:

/*LS:-# *Tag_name* SHOWSTAR*/

where

- *L* (optional) indicates it is a literal (static) string. This symbol prevents a tag read. If you type a tag placeholder for the *Tag_name*, the value of the placeholder is substituted from the parameter file or global object parameter definition. The value cannot contain spaces.
- *S* indicates it's a string embedded variable.
- - (optional). A minus sign (-) before the # indicates that if the string is longer than the fixed number of characters, the right-most characters will be shown.
- # indicates the number of characters if you select a fixed number of characters; type 0 if you don't want to use a fixed number.
- *Tag_name* is the tag to show; you can also type a literal string or tag placeholder here. The string cannot contain spaces.
- *SHOWSTAR* (optional) specifies that if the string is longer than the fixed number of characters, an asterisk (*) will be shown to indicate the string is truncated. If you use the minus sign (-), the asterisk will be shown as the first character at the left end of the string. Otherwise, the asterisk will be shown as the last character at the right end of the string.

Examples: String embedded variable syntax

To show the current value of a string tag called Blower_status, with a fixed length of 20 characters, you would type this:

```
/*S:20 Blower_status*/
```

To show the literal string Oven temperature, type this:

```
/*LS:20 "Oven temperature"*/
```

To show the literal string 36.5, type this:

```
/*LS:3 36.5*/
```

To assign the tag placeholder #1, without a fixed string length, type this:

```
/*S:0 #1*/
```

To show the value of the string tag Conveyor_message, with a fixed length of 40, showing the right-most characters, with an asterisk to indicate if the message is truncated, type this:

```
/*S:-40 Conveyor_message SHOWSTAR*/
```

Time and date embedded variable syntax

Use time and date embedded variables to insert the current time or date into captions, title bars, and messages

Time and date embedded variables use this syntax:

/**Time_date_format**/

where

Time_date_format uses one of these character sequences:

These characters	Specify this format
SD	Short date
LD	Long date
SDT	Short date and time
LDT	Long date and time
T	Time
TSD	Time and short date
TLD	Time and long date

Example: Time and date embedded variable syntax

To show the time followed by the short date, you would type this:

/*TSD*/

A space is placed between the time and date when the embedded variable is shown at run time.

How embedded variables are updated at run time

At run time, this is how embedded variables are shown and updated:

- **Graphic objects and title bars** — When a display containing a graphic object or title bar that uses an embedded variable is open, the value of the embedded variable is updated whenever a new tag value is read from the data source. For time and date embedded variables, the time and date are updated as the system time and date change.
- **Local messages** — When a display containing a local message display object is open, and the message the object is showing contains an embedded variable, the value of the embedded variable is updated whenever a new tag value is read from the data source. For time and date embedded variables, the time and date are updated as the system time and date change.
- **Information messages** — The value of the embedded variable is read when the information message is first shown. It is not updated after that.

  If the message is printed, it is printed using the value the variable had when the message was first shown. This value is retained if you shut down and restart the application.

- **Alarm messages** — The value of the embedded variable is read when the alarm occurs, and is shown in the message associated with the alarm. It is not updated after that.

  If the message is printed, it is printed using the value the variable had when the alarm first occurred. This value is retained if you shut down and restart the application.

How embedded variables are shown at run time

If there is no valid data available for the embedded variable, the variable is replaced with question marks (?). This could occur when a display first opens and the data has not arrived yet, or when there is a problem that prevents communication with the data source.

If a string or numeric embedded variable has been set up but no tag has been assigned, the embedded variable is replaced with asterisks (*).

Numeric embedded variables

The value shown for a numeric embedded variable depends on whether the tag value is a floating-point number or an integer. Integer values are shown as is. Floating-point values are rounded to fit the specified number of digits for the variable.

For example, if the variable is set up to show 6 digits, 1234.56 is rounded to 1234.6. 1234.44 is rounded to 1234.4. The decimal counts as one of the digits.

For more information about how values are rounded, see How values are rounded on page 98.

If the tag value, including the decimal point and minus sign, contains more digits than specified for the variable, the numeric variable is replaced with asterisks.

For example, if the variable is set up to show 6 digits, and the tag value is -123456, the variable will be replaced with asterisks.

Literal numbers are shown using the same rules as numeric tag values.

Number formats

The numeric variable uses the number format of the current application language. For example, if the application language uses a comma for the decimal symbol, the numeric variable uses a comma for the decimal symbol.

For information about using multiple languages, see Set up language switching on page 197.

String embedded variables

For string embedded variables that do not use a fixed number of characters, the entire string tag value is shown, unless a null character is read. Nothing after a null character is shown.

If a fixed number of characters is used, the variable shows the value of the tag up to the number of characters specified, unless a null character is encountered before the specified length. Nothing is shown after a null character. If necessary, spaces are used to make up the required number of characters.

Null characters have a hex value of 0. The null character indicates the end of string input. It does not add to the actual string length.

If the string is longer than the specified number of characters, it is truncated to fit the number of characters. If the SHOWSTAR option is used, an asterisk (*) replaces the first or last character shown. If the embedded variable is set up to show right-most characters, excess characters are truncated at the left end of the string and the asterisk (if used) appears at the left. Otherwise, the right-most characters are truncated and the asterisk (if used) appears at the right.

Literal strings are shown using the same rules as string tag values.

Time and date embedded variables

For embedded variables that show both the time and the date, a space is placed between the time and date when the embedded variable is shown at run time.

Time and date formats

Time and date embedded variables use the time and date formats for the current application language. For example, if you specify the short date format, at run time the display uses the short date format that the application language uses.

For information about using multiple languages, see Set up language switching on page 197.

Use parameters and global objects

This chapter describes:

- Use tag placeholders and parameter files or lists
- Create tag placeholders
- Create parameter files and parameter lists
- Use global objects
- Create global object displays and base objects
- Create, set up, and delete reference objects
- Use global object parameters
- Adding controller instruction faceplates that connect to Logix5000 processors

The topics in this chapter describe features of FactoryTalk View Studio that can help you set up your applications more quickly by reusing similar groups of objects and graphic displays.

- Tag placeholders, parameter lists, and parameter files allow you to use the same graphic display with different sets of tags.
- Global objects allow you to use multiple instances of the same graphic object and make changes to all of the objects at once.
- Global object parameters allow you to assign different sets of tags to different copies of the object without breaking the link to the base object, thus preserving the ability to update all copies of the object at once.
- Controller instruction faceplates provide pre-configured graphic displays that interact with the instructions in Logix5000 processors.

Use tag placeholders

Use a tag placeholder to mark where you want to insert a tag name or some part of a tag name at run time. A tag placeholder is a crosshatch character (#) followed by a number from 1 to 500.

FactoryTalk View Machine Edition uses three methods for replacing a tag placeholder with a tag name:

- Parameter files
- Parameter lists

- Global object parameters

To use the same graphic display with different sets of tags, use tag placeholders with parameter files or parameter lists. Using tag placeholders can be quicker than duplicating a display and setting up the objects in it to use a different set of tags, especially when the display uses a lot of tags. Using parameter files or parameter lists also reduces the size of the runtime application file.

You can use tag placeholders wherever you would normally assign a tag to an object, including in expressions and embedded variables. You can also use tag placeholders in the expressions you create to animate objects.

Tag placeholders can provide a way to use one graphic display to represent a number of similar operations. For example, suppose you are creating displays for a plant that cans corn and peas. The machinery used in both processes is identical. Instead of creating two displays and specifying corn-related tags in one display and pea-related tags in another, you can create one display and not specify any tag names. Where a tag name is required, type a tag placeholder.

Use parameter files or parameter lists to specify which tags to substitute for which placeholders when a display opens at run time. For information about using parameter files, see Create parameter files on page 504. For information about using parameter lists, see Create parameter lists on page 507.

You can also use tag placeholders with global objects. You can assign tag placeholders to the connections for base objects, and to connections for reference objects with the **LinkConnections** property set to **False**. For more information about global objects, see Use global objects on page 509.

You can use tag placeholders in:

- The graphic display that opens when the application is first run. Specify the graphic display to open, and the parameter file or parameter list to use with it, in the Startup editor.
- Graphic displays that are opened using Goto display buttons. Specify the graphic display to open, and the parameter file or parameter list to use with it, when you set up the button.
- Graphic displays that are opened using display list selectors. Specify the graphic displays to open, and the parameter files or parameter lists to use with them, when you set up the display list selector.
- The graphic display that opens when a logout button is pressed.
- The graphic display specified in the **Project Settings Runtime** tab when auto logout is enabled.
- Displays specified in the **Display** tab of the **Global Connections** editor.

Steps for using tag placeholders

Follow these steps to use tag placeholders with parameter files or parameter lists:

1. In the **Graphics** editor, create graphic objects and assign tag placeholders to the objects.

2. If you are using parameter files, create parameter files in the **Parameters** editor for each set of tags that the display will use. In the parameter files, specify which tags to substitute for which placeholders.

3. In the **Graphics** editor, create Goto display buttons, logout buttons, or display list selectors for opening the display containing tag placeholders. Specify the appropriate parameter files in the graphic object's dialog box.

   To use parameter lists, specify the tags for the lists in the dialog box.

   For information about setting up Goto display buttons, see Set up Goto display buttons on page 425.

   For information about setting up display list selectors, see Set up display list selectors on page 427.

   For information about setting up buttons, see To set up a button on page 405.

4. If the startup display uses tag placeholders, in the Startup editor, specify the parameter file to use with the startup display. To use a parameter list, specify the tags for the list in the Startup editor.

   For information about the Startup editor, see Create runtime applications on page 221.

5. If auto logout is enabled, you have the option of opening a display on logout. Specify the appropriate parameter file in the Runtime tab of the **Project Settings** dialog box. To use a parameter list, specify the tags for the list in the **Project Settings** dialog box.

   For information about the **Project Settings** editor, see Help.

6. If the displays that will be changed remotely by global connections use parameters, specify the parameter file or parameter list in the **Display** tab of the **Global Connections** editor.

   For information on global connections, see Set up global connections on page 111.

Create tag placeholders

A tag placeholder is the crosshatch character (#) followed by a number.

The tag placeholder can replace any part of a tag name, including folder names. For example, you could create a parameter file specifying that the tag placeholder #1=Folder1. You could assign the folder and a tag name to a graphic object's connection: #1\Tag1.

You can create tag placeholders in:

- The **Connections** tab of an object's **Properties** dialog box.
- The **Connections** tab of the **Property Panel**.
- The **Expression** box in the **Animation** dialog box.
- A global object's **Parameter Definitions** dialog box.
- Anywhere that you can insert an embedded variable. For information about embedded variables, see Use embedded variables on page 493.

To create a tag placeholder

- Type the cross-hatch character followed by a number from 1 to 500 (no space in between). For example, #1.

Create parameter files

The parameter file specifies which tags to substitute for the placeholders in the display, by assigning one tag to each unique placeholder in the display. Create a parameter file for each set of tags that you want to use with the same graphic display.

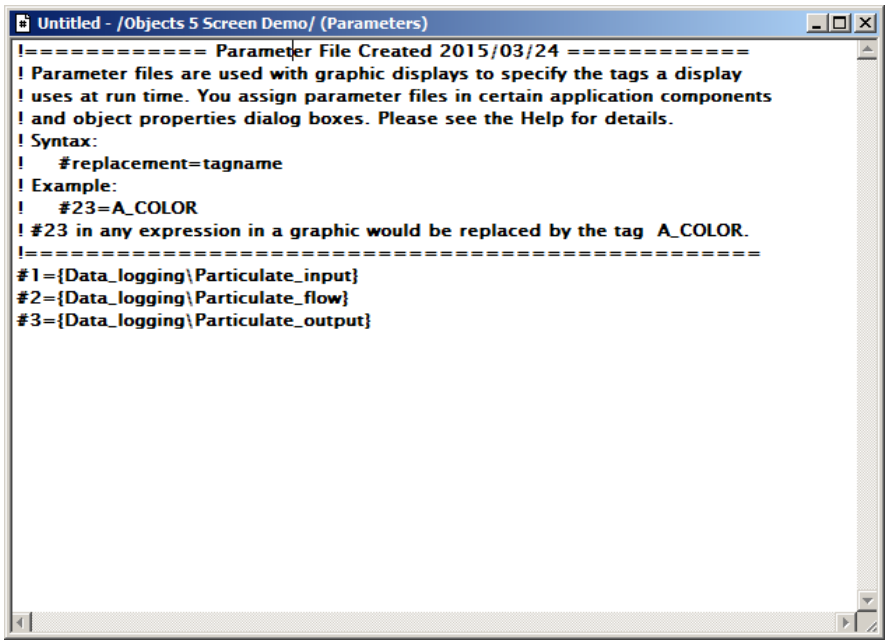
At run time, the tag values that are shown depend on which parameter file is used when the display opens. When you open the display, the tags specified in the parameter file replace the tag placeholders.

Parameters can replace any portion of a tag address. For example, you can use parameters to replace folder names.

Parameter files can list up to 500 tag placeholders. Use them when a large number of tag placeholders are needed for a display. The text format of a parameter file allows you to see and edit the placeholders easily. When copying displays from one application to another, the related parameter files must also be copied.

Use the Parameters editor

Use the **Parameters** editor to create one or more files of tag placeholder replacements. Each file is stored in the editor's folder. You can open and work on multiple parameter files at the same time.


Untitled - /Objects 5 Screen Demo/ (Parameters)
!============ Parameter File Created 2015/03/24 ============
! Parameter files are used with graphic displays to specify the tags a display
! uses at run time. You assign parameter files in certain application components
! and object properties dialog boxes. Please see the Help for details.
! Syntax:
! #replacement=tagname
! Example:
! #23=A_COLOR
! #23 in any expression in a graphic would be replaced by the tag A_COLOR.
!==
#1={Data_logging\Particulate_input}
#2={Data_logging\Particulate_flow}
#3={Data_logging\Particulate_output}

For details about using the **Parameters** editor, see Help. To open the Help, press **F1** on your keyboard.

Example: Use a parameter file to replace tag placeholders

This example shows how to use a graphic display called Canning Overview with two sets of tags, one for canning corn, and one for canning peas.

The Canning Overview display is opened from a graphic display called Main Menu.

1. Create these sets of tags. You can use both HMI and data server tags.

Tag type	Tag name	Tag name
String	Corn_Name	Pea_Name
Analog	Corn_Temp	Pea_Temp
Analog	Corn_Weight	Pea_Weight
Analog	Corn_Level	Pea_Level

2. Create two parameter files, called *Corn and Peas*, containing these parameters:

Corn	Peas
#1=Corn_Name	#1=Pea_Name
#2=Corn_Temp	#2=Pea_Temp
#3=Corn_Weight	#3=Pea_Weight
#4=Corn_Level	#4=Pea_Level

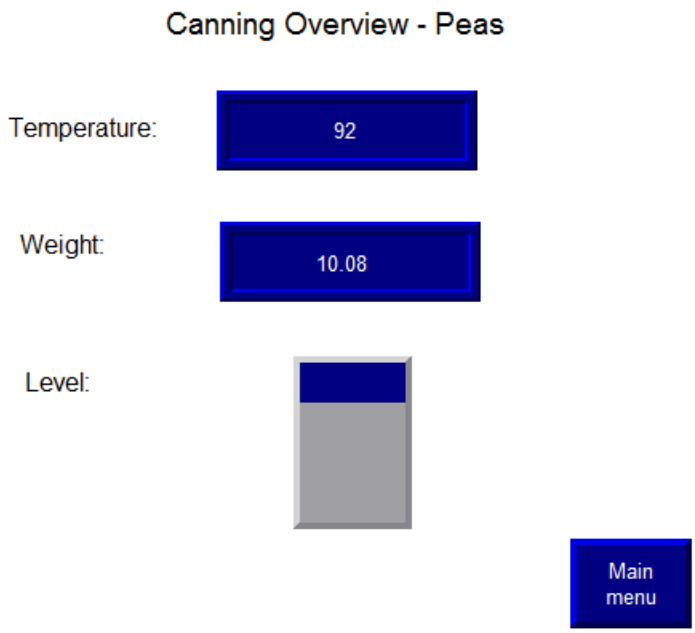
3. In the Canning Overview display, assign tag placeholders to the Value connections for these graphic objects:

This graphic object	Uses this tag placeholder
String display	#1
Numeric display 1	#2
Numeric display 2	#3
Bar graph	#4

4. Use descriptive text to illustrate the objects in the display.
5. In the **Main Menu** display, create a display list selector for opening the Canning display, with two states.
6. Assign the Corn parameter file to one state, and the Peas parameter file to the other.
7. Call the captions for the states Corn and Peas, respectively.

At run time, when the operator selects the Peas state on the display list selector in the Main Menu, and presses the **Enter** key, the Canning Overview display opens and shows the values of the Pea_ tags. When the operator selects the Corn state, the values of the Corn_ tags are shown.

The Canning Overview display looks like this when the operator selects the Peas state:



Create parameter lists

You create parameter lists by selecting the tags as you set up the objects that will open the displays that use them. The first tag in the list will replace placeholder #1, the second tag in the list will replace #2, and so on. A parameter list stays with the object when it is copied or duplicated, and with the graphic display in which it is created, when the display is copied or moved.

Parameter lists can be used anywhere that parameter files can be used. The parameter list option appears in:

- The **States** tab of the **Display Selector** object
- The **General** tab of the **Logout** button and Goto display button objects
- The Initial graphic option on the **Startup** editor
- The **Runtime** tab of the **Project Settings** editor
- The **Display** tab of the **Global Connections** editor

Parameter lists are defined in the object on the display. If the display or the object is copied or imported to another application, the parameter list stays with the object.

Follow these steps to use tag placeholders and parameter lists:

1. In the **Graphics** editor, create graphic objects and assign tag placeholders to the objects.

2. In the dialog box where the parameter list option appears, click on the Browse button to open the **Tag Browser**.

3. Select the first tag or folder to add to the list and click **OK**. The tag or folder name appears in the parameter list text box. At run time, this tag replaces placeholder #1.

4. To add another tag to the list, repeat steps 2 and 3. Each tag in the parameter list box is separated from the previous tag by a comma. At run time, the second tag replaces placeholder #2, the third tag replaces placeholder #3, and so on.

Example: Use a parameter list to replace tag placeholders

This example shows how to use a graphic display called Canning Overview with two sets of tags, one for canning corn, and one for canning peas.

The Canning Overview display is opened from a graphic display called Main Menu.

1. Create these sets of tags. You can use both HMI and data server tags.

Tag type	Tag name	Tag name
String	Corn_Name	Pea_Name
Analog	Corn_Temp	Pea_Temp
Analog	Corn_Weight	Pea_Weight
Analog	Corn_Level	Pea_Level

2. In the Canning Overview display, assign tag placeholders to the Value connections for these graphic objects:

This graphic object	Uses this tag placeholder
String display	#1
Numeric display 1	#2
Numeric display 2	#3
Bar graph	#4

3. Use descriptive text to illustrate the objects in the display.

4. In the Main Menu display, create a display list selector for opening the Canning display, with two states.

5. In the first state, choose the parameter list option and select the Corn parameter tags from the **Tag Browser** in this order: Corn_Name,

Corn_Temp, Corn_Weight, Corn_Level. In the second state, do the same for the Peas tags.

6. Call the captions for the states Corn and Peas, respectively.

At run time, when the operator selects the Peas state on the display list selector in the Main Menu, and presses the **Enter** key, the Canning Overview display opens and shows the values of the Pea_ tags. When the operator selects the Corn state, the values of the Corn_ tags are displayed.

Parameter passing

You can use parameter files or parameter lists to pass (carry forward) parameters from one display to other related displays that open from it. To carry the same parameter forward to subsequent displays, assign the same tag placeholder (for example, #1), instead of a tag name in the parameter list or parameter file field of the object in the related display.

Example: Use a parameter list to replace tag placeholders in linked displays

This example uses PIDE faceplate displays to demonstrate parameter passing.

The main, or first level display, is called MAIN. It has a Goto display button that opens a Logix_PIDE faceplate display. The faceplate has a Goto display button that opens a Trend faceplate.

In the Main display, the Goto display button has the parameter list option on the General tab selected, and a structure tag name, with a shortcut, selected from the **Tag Browser** to represent #1: {::[PLC1] Program:Fermenter_Temp.Tank_PIDE01}, for example.

When the button is pressed, the Logix_PIDE faceplate opens. The objects on the faceplate have been set up to read the tags in the structure: #1.CV, #1.SP, and so on. The objects replace the parameter #1 with the structure tag name and then derive their values from the structure elements they have been set up to read.

To carry the same parameters forward another level, the Goto display button on the Logix_PIDE faceplate display has the parameter list option on its General tab selected, and the parameter {#1} typed in. When this button is pressed, the Trend faceplate opens, and its objects in turn replace their #1 parameters with the same structure tag name, and read their values from the appropriate elements.

Use global objects

FactoryTalk View global objects allow you to link the appearance and behavior of a graphic object to multiple copies of that object. When you update the original object, the changes are automatically applied to all the copies of the object.

You create global objects in global object displays, in the Global Objects folder of the **Explorer** window. The objects you create in a global object display are called base objects.

You can copy or drag base objects into standard graphic displays. The copied object is called a reference object. You can copy a global object into any number of graphic displays, and multiple times into the same graphic display.

Global object displays have the file extension .ggfx. They are stored in this default location.

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects***Application Name***Global Objects**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects***Application Name***Global Objects**

where *Application Name* is the name of your application.

Steps for setting up global objects

Follow these steps to set up global objects:

1. In the **Graphics** editor, create a global object display. For more information, see the next section.
2. Create graphic objects in the global object display. These are the base objects. Set up their appearance, animation, and connections.
3. Copy or drag base objects into a standard graphic display. The copied objects are reference objects. For more information, see Create reference objects on page 511.
4. Edit the link properties of the reference objects as desired. For more information, see Set up reference objects' link properties on page 513.

Create global object displays and base objects

You can create a global object display in the Global Objects folder, or create a graphic display in the Displays folder and then add the display to the Global Objects folder. You can also add library displays to the Global Objects folder.

The objects you create in the global object displays are called base objects.

To create a global object display

1. In the **Graphics** folder, right-click **Global Objects**, and then select **New**.
2. Create graphic objects in the display. These are the base objects.

   Note: You cannot use ActiveX objects as base objects. You cannot convert objects to wallpaper in the global object display.

   For information about creating graphic objects, see Use graphic objects on page 331.

3. From the **File** menu, select **Save**, or click the Save tool .
4. In the **Component name** box, type a name for the display, and then click **OK**.

   The display is added to the list in the **Global Objects** folder.

To add a display or library to the Global Objects folder

1. In the Explorer window, in the Graphics folder, right-click the Global Objects icon.
2. Click **Add Component Into Application.**
3. Browse to and select the display or library to add, and then click **Open**.

   The display is copied into the Global Objects folder, and given the file extension .ggfx.

   Any ActiveX objects are deleted. All other objects are converted to base objects.

   Note: If you delete, remove, or rename a global object display, you break the links between the base objects in the display and their reference objects. For more information about breaking links, see Help.

Create reference objects

FactoryTalk View global objects allow you to link the appearance and behavior of a graphic object to multiple copies of that object. When the original base object is updated, the changes are automatically applied to all the copies of the object. The copies of the base object are called reference objects.

You can copy or drag base objects into standard graphic displays. Each copied object becomes a reference object. You can also copy, drag, and duplicate reference objects that you have already created to create more copies of the base object.

Note: Base objects can be group objects. This provides powerful template capabilities. When you add or remove objects from the base object group, all the reference objects are automatically updated.

If desired, you can assign unique connections, animation, and size to the reference object.

To create a reference object

1. Copy an object from a global object display to a standard graphic display.
2. To assign unique connections, animation, or size to the object, double-click the object to open the **Property Panel**.
3. For information about using the **Property Panel**, see Use the Property Panel on page 360.

You can also create reference objects by adding a global object display to the Displays folder. All the objects in the new display are reference objects.

To add a global object display to the Displays folder

1. In the Explorer window, in the Graphics folder, right-click the Displays icon.
2. Click **Add Component Into Application**.
3. Browse to and select the global object display to add, and then click **Open**.

   The display is copied into the Displays folder, and given the file extension .gfx. All the objects are converted to reference objects.

To edit a reference object's base object

1. Right-click the reference object, and then select **Edit Base Object**.
2. The global object display containing the base object opens, with the object selected.
3. Make your changes to the base object.
4. All reference objects linked to the base object are updated.

To view the changes to the reference object, close the display containing the reference object, and then reopen it. Or, toggle the object's **LinkSize** property on and off.

Set up reference objects' link properties

FactoryTalk View global objects allow you to link the appearance and behavior of a graphic object to multiple copies of that object. When the original base object is updated, the changes are automatically applied to all the copies of the object.

The copies of the object are called reference objects, and they have the same properties as the original base object. If desired, you can assign unique size, connections, and animation to the reference object.

To assign unique properties to the reference object, use the **Property Panel** to edit the following properties for the reference object:

- **LinkSize** — select **False** to set up the height and width separately for the reference object. If **LinkSize** is set to true, when you try to resize the reference object, it will snap back to its linked size.
- **LinkConnections** — select False to set up connections separately for the reference object. Whether you use the base object's connections, or set up separate connections, the tags used count towards the tag limit for the display.

  You can assign tag placeholders to the connections for base objects, and to connections for reference objects with the **LinkConnections** property set to False.
- **LinkAnimation**—select **Do not link to set up separate animation** for the reference object. To use the animation set up for the base object but assign different expressions to the reference object, select **Link without expressions**.

  If you select **Link with expressions**, the reference object uses the animation and expressions assigned to the base object.

Reference objects also have a property called *LinkBaseObject*, which specifies the name and location of the base object to which the reference object is linked. You cannot edit the **LinkBaseObject** property.

To change a reference object's link properties

1. Double-click the object to open the **Property Panel**.
2. Make your changes to the link properties.
3. Specify the new size, connections, or animation for the object.

For information about resizing objects, see Resize objects on page 375.

For information about assigning connections to objects, see Assign tags and expressions to an object's connections on page 361.

For information about assigning animation to objects, see Animate graphic objects on page 457.

To specify default link properties for reference objects

1. From the **Edit** menu, select **Global Object Defaults**.
2. Specify the new default values.
3. Click **OK**.

   The defaults are used for any new reference objects you create. You can still edit the properties for individual objects separately.

To break the link to a base object

- Right-click the reference object, and then click **Break Link**.

  The reference object becomes a regular object. You can edit all of its properties. However, you cannot restore the connection to the base object.

Delete the base object

If you delete a base object or a global object display containing base objects, any reference objects that are linked to the deleted base objects are broken. A broken reference object is displayed as a red square with an X through it. You cannot edit broken reference objects.

To repair a broken reference object

- Recreate the base object with the same object type and name as before, on the same display as before.

Use global object parameters

Global object parameters are parameters that you can assign to global objects. You can use a global object parameter to assign different tags or sets of tags to each reference object without breaking the link to the base object. You can then make changes to the base object and all the associated reference objects at the same time.

Use global object parameters when more than one instance of a global object is used on a display. For example, the Logix_PIDE global object display contains a grouped object composed of other grouped objects. The objects'

connections are set up with tags and expressions that use values from a set of Logix5000 tags. When you create multiple reference objects from this base object, each reference object can use a different set of Logix5000 tags. The global object parameters you assign to the base object allow you to do this, because you are using a placeholder instead of a specific backing tag (a backing tag is a path to a folder of tags; it is also known as a structured tag). If you then change, add, or remove a tag or expression in the base object, the same change is made to all the reference objects.

If you don't use global object parameters, you can still assign different tags to different reference objects by changing the reference object's LinkConnections property to False and the LinkAnimations property to Link without expressions.

The global object parameter takes the same form as a regular parameter: *#1*, where *1* can be any number from 1 to 500. The parameter can be the placeholder for an individual tag or for a folder of tags. For example, #1 could be a placeholder for the path to the folder containing the PIDE tags assigned to the global object.

When you set up the base object, specify the global object parameters to use with the object. You can provide a description of each parameter to remind you or another application designer of the type of value to assign to the parameter on the reference object. Then assign specific values to each parameter for the reference object. You can assign numeric or string constants, tags, or backing tags.

Difference between global object parameters and regular parameters

Global object parameters allow you to assign different values to different instances of the same placeholder. For example, each reference object in the display might have the placeholder #1. Using regular parameter files, you could only assign one value to #1, and this would apply to all objects in the graphic display. With global object parameters, you can assign a different value to #1 for each object that uses the placeholder #1.

If a placeholder is defined in a global object parameter for an individual object and defined in a parameter file, the definition assigned to the object takes precedence.

Use global object parameters with group objects

To use global object parameters with a group object, the parameters are defined at the group level, not at the level of individual objects. Thus the definition applies to each object within the group. You can assign as many parameters as desired to the group. For example, you might assign #1 to

some members of the group and #2 to other members of the group. If you create a global object parameter definition for an object and later group the object, the definition is deleted. In addition, if you create a global object parameter definition for a group and then ungroup the object, the definition is deleted.

Values are assigned to the global object parameters at the group level as well. You cannot assign separate values to individual objects in the group.

Steps for using global object parameters

Follow these steps to use global object parameters:

1. In the global object display, assign placeholders and parameter definitions to the base object. For details, see the next section.

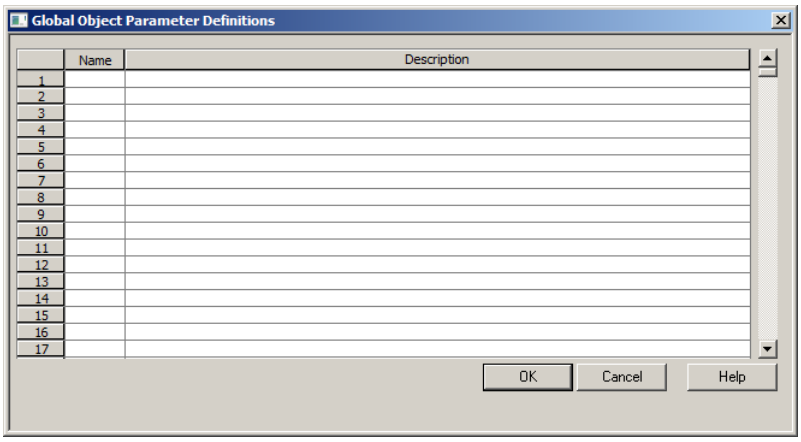
2. In the standard graphic display, select the reference object and specify the value to use for each parameter. For more information, see Create reference objects on page 511.

To specify global object parameters for the base object

1. Create placeholders in each place where you want to use a global object parameter. You can create the placeholders anywhere a tag or expression is required.

   You can also type placeholders in embedded variables by using a literal string embedded variable. For information about embedded variables, see Use embedded variables on page 493.

2. Right-click the global object or grouped global object, and then select **Global Object Parameter Definitions**.

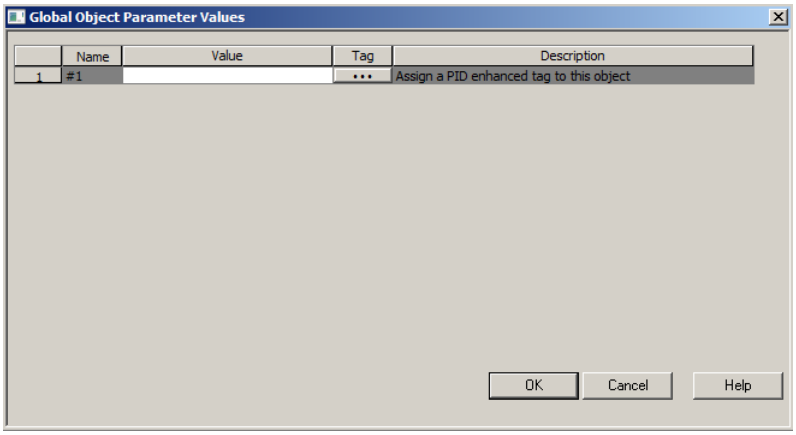


3. Specify a parameter for each placeholder for the object. If desired, type a description for each parameter.

For details about using the **Global Object Parameter Definitions** dialog box, see Help. To open the Help, press **F1** on your keyboard.

To specify the parameter values for the reference object

1. Right-click the reference object or grouped reference object, and then select **Global Object Parameter Values.**



2. Specify a value for each parameter. The value can be a tag, backing tag, or numeric or string constant. Numeric constants are treated as strings of text.

Use controller instruction faceplates

Controller instruction faceplates are pre-configured graphic displays and global object displays that interact with Logix5000 processors.

Controller instruction faceplates contain graphic objects that display values from a Logix5000 processor and allow operators to interact with the processor. You can use the faceplate graphic displays as stand-alone displays, or copy the faceplate objects into other graphic displays. If desired, you can edit the objects in the faceplates. For example, you might want to add your company logo or change the colors used in the faceplates.

To use a controller instruction faceplate, you must add it to your application and specify the path to the Logix5000 processor instructions used by the faceplate. The faceplates are set up so that you can specify the path to the instructions using parameter files. For more information, see the Help for the faceplates, accessible from the **Add Controller Instruction Faceplates** dialog box.

FactoryTalk View Studio comes with sets of faceplates that work with these Logix5000 instructions:

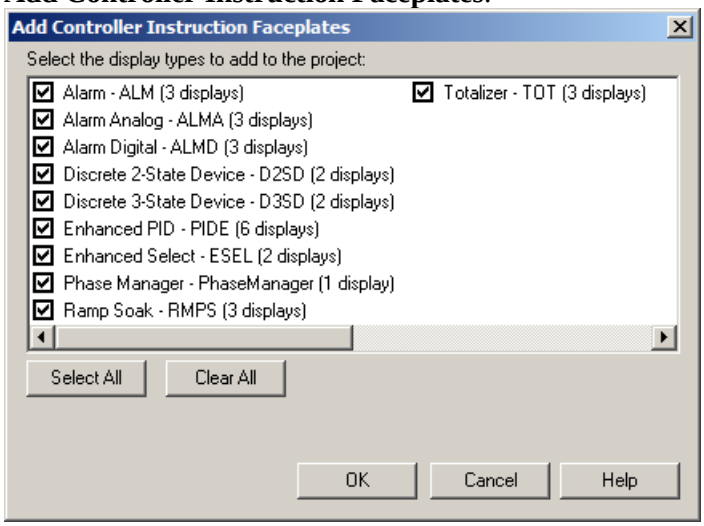
- Enhanced PID (Logix_PIDE)
- Discrete 2-State Device (Logix_D2SD)
- Discrete 3-State Device (Logix_D3SD)

- Totalizer (Logix_TOT)
- Enhanced Select (Logix_ESEL)
- Alarm (Logix_ALM)
- Ramp/Soak (Logix_RMPS)
- PhaseManager (Logix_PhaseManager)

The name in parentheses is the name of the main graphic display and global object display. Other displays in the set are named beginning with this name, followed by a segment describing the purpose of the subdisplay. For example, Logix_ALM has two subdisplays called Logix_ALM_Config and Logix_ALM_Status. When you add controller instruction faceplates, any graphic images associated with the faceplates are added to the Images folder

To add controllerinstruction faceplates to an application

1. In the Explorer window, right-click the HMI server, and then select **Add Controller Instruction Faceplates**.


Add Controller Instruction Faceplates
Select the display types to add to the project:
Alarm - ALM (3 displays)
Alarm Analog - ALMA (3 displays)
Alarm Digital - ALMD (3 displays)
Discrete 2-State Device - D2SD (2 displays)
Discrete 3-State Device - D3SD (2 displays)
Enhanced PID - PIDE (6 displays)
Enhanced Select - ESEL (2 displays)
Phase Manager - PhaseManager (1 display)
Ramp Soak - RMPS (3 displays)
Totalizer - TOT (3 displays)
Select All
Clear All
OK
Cancel
Help

   The **Add Controller Instruction Faceplates** dialog box opens.

2. Select the faceplates to add.

For details about selecting options in the dialog box, see Help.

Set up data logging

This chapter describes:

- Steps for setting up data logging
- Data log files
- Data log models
- Change the data log model used at run time
- Show data logs using the trend graphic object
- Problems with data logging

Steps for setting up data logging

Follow these steps to set up data logging:

1. In the **Data Log Models** editor, set up a data log model that specifies how many log values to store, the conditions that trigger data logging, where to log data, and which tags to monitor.

2. In the **Startup** editor, turn on data logging by selecting the **Data logging** check box. Also use this editor to specify the data log model to use at run time. See Create runtime applications on page 221.

3. In the **Graphics** editor, create a graphic display containing the trend graphic object, and set up how the object looks, which tag values to show, the start time, and the time span for the data. Also specify the name of the data log model to use.

Data log files

As soon as the application starts running, FactoryTalk View begins logging tag values to the data log files. When the maximum number of data points have been logged, the oldest data is deleted to make room for the new data. FactoryTalk View supplies data from the log files to the trend object for the requested tags and time span.

The data log files are retained when you restart an application after a shutdown or power loss. You can delete the log files from the runtime computer at application startup.

Use data logging to keep a permanent record of tag data. You can record tag data as tag values change, or on a periodic basis (for example, every minute).

For information about deleting the log files, see Delete log files on the runtime computer on page 243.

File names

FactoryTalk View creates two data log files:

- *Data Log Model Name*.log
- *Data Log Model Name*.tag

You'll need this information if you log to a custom path and want to delete the log files manually.

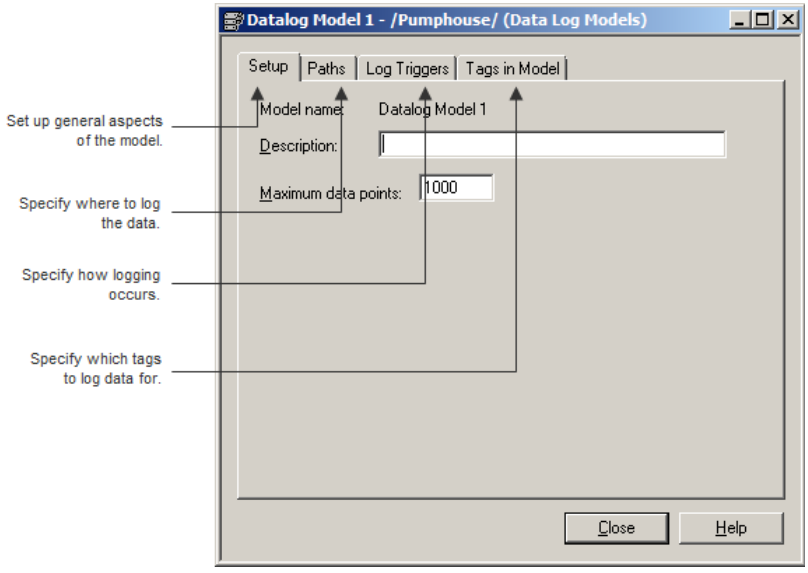
Data Log Models

A data log model defines which tags to log data for, as well as how and where the data is logged.

You can set up multiple data log models, but you can run only one data log model at a time. For information about running a different data log model, see Change the data log model used at run time on page 522.

Create Data Log Models

Use the **Data Log Models** editor to create one or more data log models. Each data log model is a file stored in the editor's folder. You can open and work on multiple models at the same time.



For detailed information about the options in the **Data Log Models** editor, see Help.

Each data log model has a unique name, and an optional description.

You can log a maximum of 1,000,000 points for version 7.00.00 or later, and you can log 300,000 points for release versions earlier than 7.00.00. The

default is 1000. When the maximum number of data points have been logged, the oldest data is deleted to make room for the new data.

Data storage locations

You can store data log files in any one of these locations:

- On the runtime computer
- On another computer on the network
- On a compact Flash Card (for PanelView Plus or PanelView Plus CE terminals only)

If the logging destination is unavailable for any reason, for example, the card is removed or the network drive becomes unavailable, data logging stops. It does not restart until you restart the application.

Log to a network location

To log data to a network location, the network drive must be shared, and the runtime computer must be logged in to the same domain as the computer on the network. To do this, the user must have access rights for the domain.

The PanelView Plus or PanelView Plus CE terminal cannot be part of a domain. However, you can verify that the user who is logged into the PanelView Plus or PanelView Plus CE terminal is on a user list that is part of a domain.

For more information about logging in to a Windows domain or authenticating users, see Log in to the application on page 263.

Data logging methods

There are two methods for triggering data logging. You can set up logging so tag values are logged:

- Periodically (periodic logging)
- Only when a tag value changes (on-change logging)

Log periodically

Periodic logging is used to take a snapshot of all tag values at a particular point in time. Tag values are logged even if there has been no change.

You cannot change the periodic log rate at run time.

Log on change

On-change logging is used to log only tags whose values have changed.

For HMI tags, before logging occurs, the change must equal a specified percentage of change in the tag value. The percentage is based on HMI tags' minimum and maximum values as set up in the **Tags** editor. Only the tags that change by the specified percentage are logged. If you specify a percentage of 0, all changes are logged.

If a tag does not have a minimum or maximum attribute (for example a data server tag in Logix5000), when you specify on-change logging, all changes are logged for that tag. You don't need to specify a percentage.

Use a heartbeat rate

You can also specify a heartbeat rate, to log values at specified times even if no tag value changes have occurred. The heartbeat ensures that the data in the log file is current. The heartbeat is also a good way to ensure that data logging is working and acquiring valid data.

The heartbeat cannot be less than the maximum update rate, which is the rate at which data servers send tag values to FactoryTalk View.

If you specify a heartbeat of 0, the heartbeat is not used.

Tags in the data log model

The data log model can contain up to 100 analog or digital tags, including both HMI and data server tags.

You cannot use string tags, array tags, tag placeholders, parameters, or expressions in your data log model.

Delete tags from the model

If you delete a tag from the data log model, previously logged data for the tag is not accessible unless you add the tag back to the model.

Change the data log model used at run time

Your application can run only one data log model at a time. Follow this procedure to switch data log models.

To run a different data log model

1. Shut down the application.
2. Start FactoryTalk View Studio and open the application.

3. In the Startup editor, specify the new data log model.
4. Create the runtime application. See Create runtime applications on page 221.
5. Transfer the runtime application to the runtime platform.

   For information about transferring applications to:

   - A personal computer, see Run applications on a personal computer on page 229.
   - A PanelView Plus or PanelView Plus CE terminal, see Transfer applications to a PanelView Plus terminal on page 247.
6. Run the new application.

Show data logs using the trend graphic object

You can use the trend graphic object to show the data that you have logged. At run time, when the operator opens a graphic display containing a trend, the trend shows values from the data log file for the data log model that is running. The data log model specifies which data to collect in the data log file.

In addition to showing historical values from the data log file, trends can show current values for the tags in the model. Trends can also show current values for tags or expressions that are not in a data log model. For more information about trends, see Set up trends on page 535.

Problems with data logging

Problems with data logging occur under these circumstances:

- When your application starts at run time, if any of the tags specified in the current data log model do not exist, an error message is sent to FactoryTalk Diagnostics.
- If the data log file is corrupted or invalid, the file is deleted and recreated, and an error message is sent to FactoryTalk Diagnostics.
- If logging to a folder on a networked computer, and the runtime computer is not logged in to the Windows domain of the network computer, the log folder cannot be created. An error message is sent to FactoryTalk Diagnostics.
- If logging to an invalid path, the log folder cannot be created. An error message is sent to FactoryTalk Diagnostics. One of the reasons that the path might be invalid is that the top-level folder of the path is not shared.
- When the application starts, FactoryTalk View checks whether there is disk space to store the data log model's data. If there is not enough space, an error message is sent to FactoryTalk Diagnostics and data logging does not start.

Use information messages

This chapter describes:

- Steps for setting up information messages
- Use the **Information Messages** and **Information Setup** editors
- Prepare to set up information messages
- How information messages work
- Create information messages in multiple languages
- The [INFORMATION] display
- Create your own information message display
- Open and close the information message display
- How the information message display graphic object works
- Change the information message file used at run time

About information messages

Use information messages to give the operator messages about the process, prompts or instructions, and information about current states.

Information messages versus local messages

Use information messages to give the operator information no matter which display is open. To give the operator information in a specific graphic display while the display is open, use local messages.

For details about local messages, see Use local messages on page 325.

Steps for setting up information messages

Follow these steps to set up information messages:

1. In the **Information Messages** editor, set up the messages and their trigger values.
2. In the **Information Setup** editor, specify the graphic display to open when information messages occur, and the file of messages to show.
3. Also use this editor to assign a tag or expression to the **Value** connection. If you want the operator to acknowledge messages, assign the **Ack** connection and specify the acknowledge hold time.

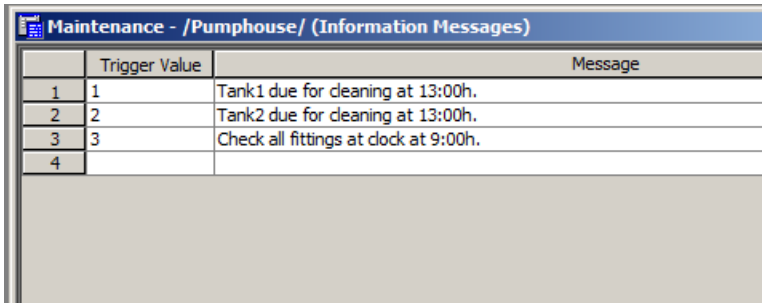
4. In the **Startup** editor, ensure that the **Information messages** box is selected (it is checked by default). See Create runtime applications on page 221.

   If desired, in the **Graphics** editor modify the default [INFORMATION] display, or create your own graphic display to use for information messages. For example, if you don't want the operator to acknowledge messages, edit the default display to remove the information acknowledge button.

   For information about graphic displays, see Use graphic displays on page 299.

Use the Information Messages editor

Use the **Information Messages** editor to create one or more files of information messages. Each file is stored in the editor's folder. You can open and work on multiple message files at the same time.

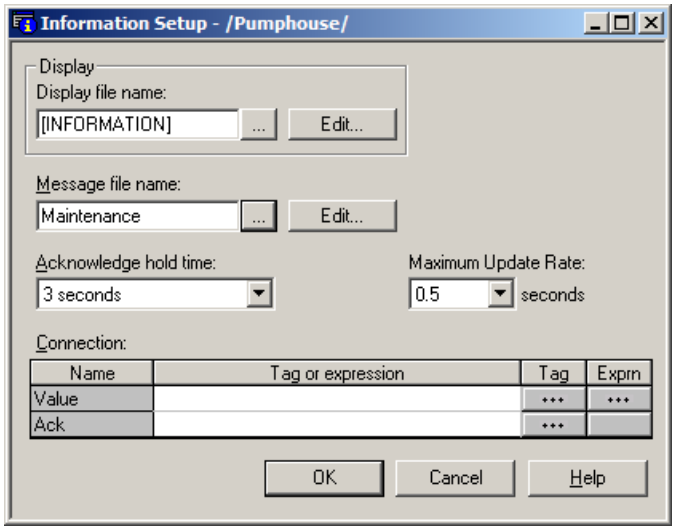


You can define up to 10,000 messages in each message file.

For detailed information about the options in the **Information Messages** editor, see Help.

Set up how information messages are shown

Use the **Information Setup** editor to set up how information messages are shown.



For detailed information about the options in the **Information Setup** editor, see Help.

Prepare to set up information messages

As your application is running, information is continually sent to the data source about the state of various processes. For example, your application might be monitoring whether a valve is open or closed, or the temperature in a boiler. Values representing the status of these processes are sent to the data source.

The data source

The FactoryTalk View documentation uses the term data source as a generic term that includes all possible sources of tag data, for both data server tags and HMI tags. The data source can be memory or a device such as a programmable controller or an OPC server. FactoryTalk View writes values to and reads values from the data source. The data source is set up to exchange information (in the form of numeric or string values) between FactoryTalk View and the machine that your application is controlling.

Identify the tags and values to monitor

To set up information messages, determine which tags associated with machine processes to monitor, and identify the values for those tags that will trigger information messages.

For information about creating tags, see Use HMI tags on page 97.

How information messages work

These are the key parts of the information message system:

- **Information message file** — a text file containing a list of messages, with a numeric trigger value for each message

- **Information message display** — a graphic display that opens at run time and shows information messages
- **Value connection** — a tag or expression. When the value of this connection matches a message's trigger value, the information message display opens with the associated message shown.

The following example shows how the key parts of the information message system work together.

Example: Set up the data source to show information messages

This example shows how to set up the data source to notify the operator that a conveyor belt has stopped. In this example, the status of two conveyor belts is being monitored. You can use both HMI and data server tags.

1. Create a digital tag called Conveyor_1_status. This tag points to an address in a programmable controller that is linked to a sensor on the first conveyor belt. When the belt is running, the tag's value is 0. When the belt stops running, the value changes to 1.

2. Create a second digital tag called Conveyor_2_status. This tag points to an address in a programmable controller that is linked to a sensor on the second conveyor belt. When the belt is running, the tag's value is 0. When the belt stops running, the value changes to 1.

3. Create an analog tag called Information_messages. Set up the data source to send a value of 1 to this tag when Conveyor_1_status has a value of 1, and to send a value of 2 to this tag when the Conveyor_2_status tag has a value of 1.

4. In the **Information Messages** editor, create these messages with trigger values matching the values that will be sent to the Information_messages tag:

Trigger value	Message
1	Conveyor belt 1 has stopped.
2	Conveyor belt 2 has stopped.

5. Save the message file with the name *Conveyor belts*.

6. In the **Information Setup** editor, assign the **Information_messages** tag to the **Value** connection, and select the **Conveyor belts message** file.

At run time, when the value of Conveyor_1_status changes to 1, the first message is shown (in the default information message display). When the value of Conveyor_2_status changes to 1, the second message is shown.

Information messages and trigger values

Create messages associated with each tag value change that you want to inform the operator about. Assign each message a trigger value, and set up the data source to send the trigger value to the **Value** connection. You can use both HMI and data server tags.

The trigger value can be any non-zero integer value (positive or negative). Trigger values do not need to be contiguous, but they must be unique for each message. For example, you could use trigger values of 1, 2, and 3, or values of 10, 20, and 30.

Trigger values cannot be 0. Digital tags have two possible values, 0 and 1. Therefore, if you use a digital tag you can only use the value 1 to trigger a message. If you want to use a digital tag to trigger two different messages, create an expression that adds 1 to the digital tag's value. That way, you can use the trigger values 1 and 2.

If you use an analog tag or an expression, you can use any non-zero integer or floating-point value to trigger an alarm. Floating-point values are rounded to the nearest integer. For information about how values are rounded, see How values are rounded on page 98.

You can create multiple information message files, but you can use only one message file at run time. For information about using a different message file, see Change the message file used at run time on page 532.

Create information messages in multiple languages

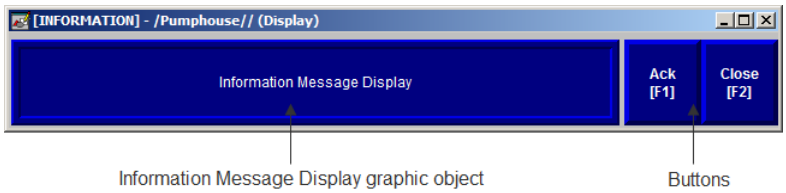
FactoryTalk View 5.00 and later supports information messages in multiple languages. When you create information messages, they are in the current application language. You can export the information messages for translation and then import them back into the application. For details, see Set up language switching on page 197.

Language switching information messages in FactoryTalk View ME Station 4.00

For applications that will run in FactoryTalk View ME Station version 4.00, use the CurrentLanguage( ) expression function to specify message offsets in the information message file. In the file, divide your messages into sections for each language. For information about the CurrentLanguage( ) function, see Language function on page 487.

The [INFORMATION] display

FactoryTalk View comes with an information message graphic display called [INFORMATION]. It contains an information message display graphic object and buttons for acknowledging the shown message and closing the display. By default, the [INFORMATION] graphic display opens automatically at run time when an information message is generated.



You can use the [INFORMATION] display as is, or modify the display. For example, you can change the color of the objects, or add and remove buttons. Or, you can create your own graphic display to use for showing information messages. In the **Information Setup** editor, specify the display to use.

Another option is to place the information message display object in a graphic display that does not open automatically when a message is generated.

For information about creating your own information message display, see Create your own information message display on page 531.

The information message display graphic object

The [INFORMATION] display contains an information message display graphic object, which lists one information message at a time.

For information about how the information message display object works at run time, see How the information message display graphic object works on page 532.

Buttons in the [INFORMATION] display

The [INFORMATION] display contains these buttons:

This button	Does this
Ack (information acknowledge)	Acknowledges the information message
Close (close display)	Closes the information message graphic display.

You can assign any caption you choose to the labels on the buttons.

Use the information acknowledge button

When the operator presses the information acknowledge button, if the **Ack connection** is assigned, the connection value is set to 1 at the data source. The value is held as long as the operator presses the button, or for the acknowledge hold time, whichever is longer. Then the connection is reset to 0.

Create your own information message display

You can create your own graphic display for showing information messages, containing an information message display graphic object and the buttons you want to use in the display.

If you create your own graphic display, use an On Top display and select the Cannot Be Replaced option.

For more information about the information message display graphic object, see How the information message display graphic object works on page 532.

For information about creating graphic displays and graphic objects, see Use graphic displays on page 299 and Use graphic objects on page 331.

Open and close the information message display

Open the display

The information message display you specify in the **Information Setup** editor (either the default [INFORMATION] display or your own display) is automatically opened whenever the **Value** connection value matches a trigger value.

You can also create a **Goto display** button that the operator can press to open the information message display. For information about setting up a Goto display button and specifying the display to open, see Help.

Close the display

The information message display closes when the **Value** connection value changes to 0.

To automatically close the display when the operator acknowledges a message, set up the data source to set the **Value** connection to 0 when the **Ack** connection is set to 1.

The operator can also close the display by pressing a close display button.

How the information message display graphic object works

At run time, when the **Value** connection at the data source changes from 0 to a non-zero value, the assigned information message display opens. If the value matches a message's trigger value, the associated information message appears in the information message display graphic object. The object can be in the default [INFORMATION] display, in an information message display you have created, or can be placed in any display in your application.

For information about setting up the information message display graphic object, see Set up information message displays on page 454.

What is shown

- If the **Value connection** is unassigned, the information message graphic display never opens automatically. If the operator opens a graphic display containing an information message display object, the object is blank.
- The **Value connection** is rounded up to the nearest integer. If the value does not match any of the trigger values in the specified message file, the display is filled with question marks (?).

  For information about how values are rounded, see How values are rounded on page 98.
- If the message is too long to fit in the information message display object, the last shown character is replaced with an asterisk (*).
- When the **Value connection** value is 0, the information message graphic display is closed.
- If you set up information messages in multiple languages, messages are shown in the current application language. When a language switch occurs, a message that was already in the information message display remains in the language that it originally appeared in. New messages are shown in the new language.

Change the message file used at run time

Your application can use only one message file at a time. Follow this procedure to switch message files.

1. Shut down the application.
2. Start FactoryTalk View Studio and open the application.
3. In the **Information Setup** editor, specify the new information message file.
4. Create the runtime application. See Create runtime applications on page 221.
5. Transfer the runtime application to the runtime platform.

For information about transferring applications to:

- A personal computer, see Run applications on a personal computer on page 229.
- A PanelView Plus or PanelView Plus CE terminal, see Transfer applications to a PanelView Plus terminal on page 247.

6. Run the new application.

Set up trends

This chapter describes:

- What trends are.
- Summary of steps for creating a trend graphic object.
- Create trends, and the **Trend Object Properties** dialog box.
- The parts of the trend graphic object.
- The different chart types.
- Choose colors, fonts, lines, and markers for the trend.
- Test the trend.
- Use objects from the Trends graphic library.
- Use buttons to control the trend at run time.
- Print trend data.
- Runtime errors for trends.

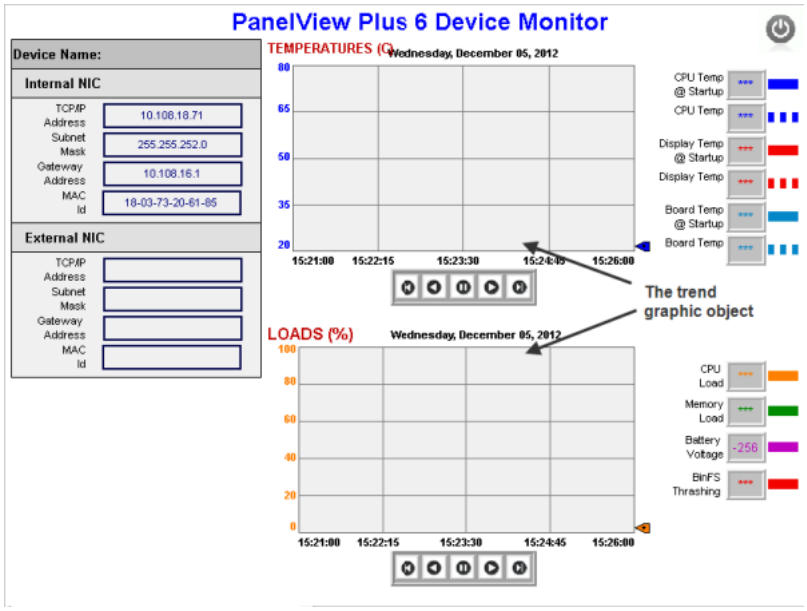
About trends

A trend is a visual representation of current or historical tag values. The trend provides operators with a way of tracking plant activity as it is happening.

You can:

- Plot data for as many as eight tags or expressions on one trend.
- Create a trend that is part of a graphic display or acts as the entire graphic display.
- Plot data over time, or plot one variable against another in an XY Plot chart to show the relationship between them.
- Show isolated or non-isolated graphs. Isolated graphing places each pen in a separate band of the chart. With non-isolated graphing, pen values can overlap.
- Create buttons to allow the operator to pause, scroll, and print the trend data.

The illustration below shows a trend that has been added to a graphic display. You can view the following display by opening the InstantFizz_ME sample application.



Current versus historical data

The data shown in a trend can come from two sources. For current values, data comes from the value table as it is collected. The value table is a record of the most recent values collected from the data source, and is stored in temporary memory while the application is running.

For historical values, data comes from a data log model's log file, if a model is assigned to the trend. You can show both current and historical data in the same trend.

For information about data log models, see Set up data logging on page 519.

Time, date, and number formats

The trend is shown using the time, date, and number formats of the current application language. For example, if the application language uses a comma for the decimal symbol, the scale on the y-axis uses commas for the decimal symbol.

For information about using multiple languages, see Set up language switching on page 197.

Steps for creating a trend

Follow these steps to create a trend:

1. To plot historical data, create a data log model in the **Data Log Models** editor. For information, see Set up data logging on page 519.
2. Create a trend graphic object in the **Graphics** editor, as described on Create trend objects on page 537.
3. Set up the trend in the **Trend Object Properties** dialog box. For details about the options in the dialog box, see Help.
4. If desired, create a next pen button, a pause button, or key buttons in the same graphic display, to allow the operator to switch between pens, pause the trend, or scroll the trend.

   For information about the buttons you can use with trends, see Use buttons to control the trend at run time on page 545.
5. To keep a printed record of the trend data, provide a way for the operator to print the graphic display. For information see Print trend data on page 546.

Create trend objects

To create a trend object

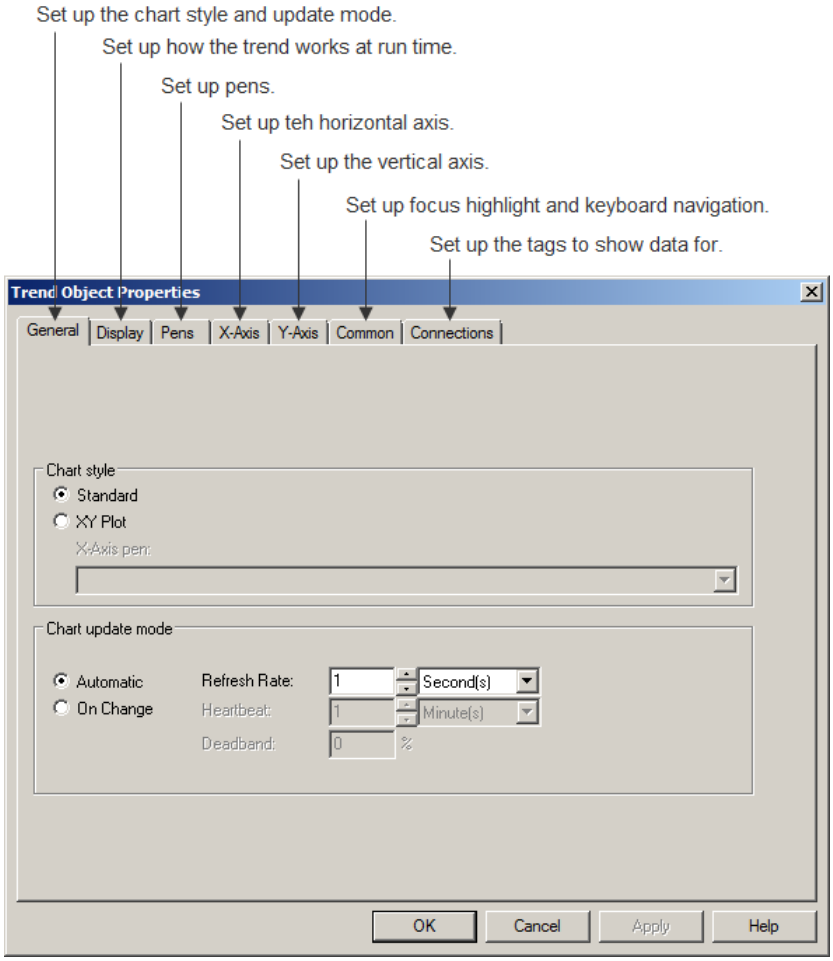
1. In the **Graphics** editor, create or open a graphic display.
2. Select the Trend drawing tool by doing one of the following:
   - In the **Objects** toolbox, click the **Trend** tool.
   - From the **Objects** menu, select **Trending** > **Trend**.
3. Drag the mouse to create a box approximately the size you want for the trend.
4. Double-click the trend to open the **Trend Object Properties** dialog box.
5. Set up the trend. For details, see Help.

Once you have set up the trend, you can edit it as you would any other graphic object. You can move it, resize it, attach animation to it, and so on. You can also use this object in other graphic displays by dragging it from one display and dropping it into another.

For more information about graphic objects, see Use graphic objects on page 331.

Set up trends

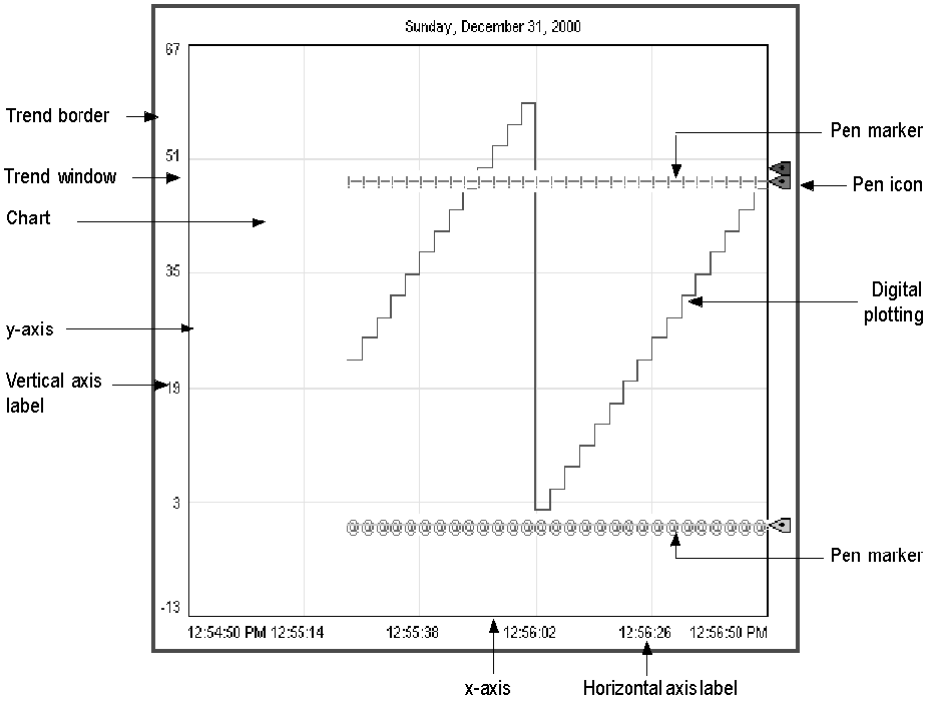
When you double-click a trend object, the **Trend Object Properties** dialog box opens. Use the dialog box to set up the trend.



For details about the options in the **Trend Object Properties** dialog box, see Help.

The parts of a trend

The illustration below shows a standard trend chart, with three pens and a two-minute time span. Two of the pens have markers. The third uses digital plotting. For more information about chart types, see Standard versus XY Plots on page 541.



Trend border

The border appears around the trend object at run time when the trend is selected.

Trend window

The area around the chart, between the border and the chart, is the trend window.

Chart

The chart is the area of the trend in which values are plotted. It is bounded by the y-axis on the left and the x-axis on the bottom. It contains the plotted trend data (shown using pen lines and pen markers), as well as grid lines (if you choose to display them).

Y-axis

The y-axis is the left vertical edge of the chart. It is also known as the vertical axis.

Vertical axis labels

The vertical axis labels show the scale (range) of values for the pens. If desired, you can set up the trend to omit the vertical axis labels.

The minimum and maximum values for the scale can be determined automatically (using the best fit for the current data), be derived from a pen's minimum and maximum values, use a constant value, or be controlled by tags.

You can set up the trend so all pens use the same scale, or use individual ranges for each pen. If you choose the latter method, create a next pen button in the graphic display, to allow operators to view the range for each pen. When the operator presses the button, the vertical axis changes to the new pen's range.

For example, if Pen 1 has a minimum value of 10 and a maximum value of 100, the range on the vertical axis is 10 to 100 when the pen is selected. If Pen 2 has a minimum of -10 and a maximum of 50, the range on the vertical axis changes to -10 to 50 when the operator presses the next pen button.

X-axis

The x-axis is the bottom horizontal edge of the chart. It is also known as the horizontal axis.

Horizontal axis labels

For standard charts, the horizontal axis labels indicate the time span covered by the trend. For XY Plot charts, the horizontal axis labels show the scale (range) of values for the pen selected to serve as the x-axis pen.

If desired, you can set up the trend to omit the horizontal axis labels. The number of labels depends on the size of the trend object and the number of vertical grid lines.

Pens

Pens are the lines and symbols used to represent values. The values can be tags you are monitoring, expressions that manipulate tag values, or constants.

If there is no data for a pen, or if the data is outside the vertical axis range, the pen does not appear in the chart.

Pen icons

Pen icons appear at the right edge of the chart at run time, if you choose to show them. The icon's position indicates the pen's most recent recorded value (from the value table), even if the trend is paused or if the most recent value has not been plotted yet.

Pen markers

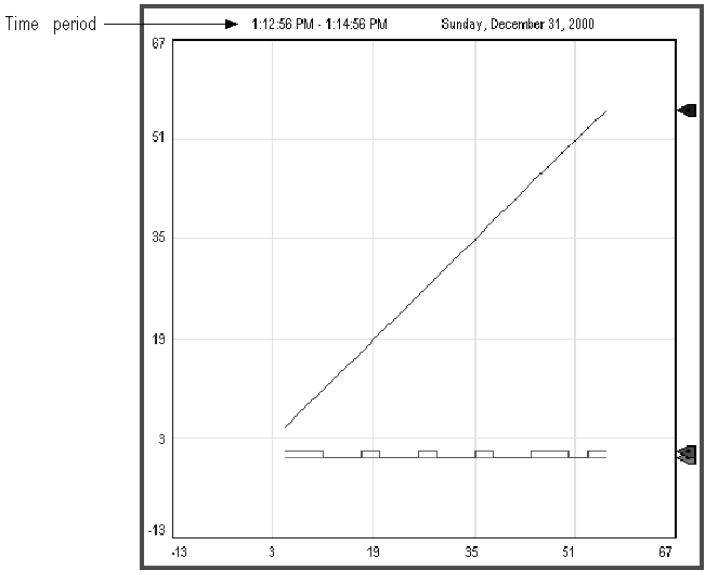
Pen markers are symbols that indicate data points. If data is plotted frequently, the markers might not appear as distinct, separate symbols. For example, see the lowest pen in the illustration on The parts of a trend on page 539.

Chart types

Standard versus XY Plots

You can create a standard chart, which plots tag values against time, or an XY Plot chart, which plots one (or more) tag's values against another's.

This illustration shows what an XY Plot chart could look like:

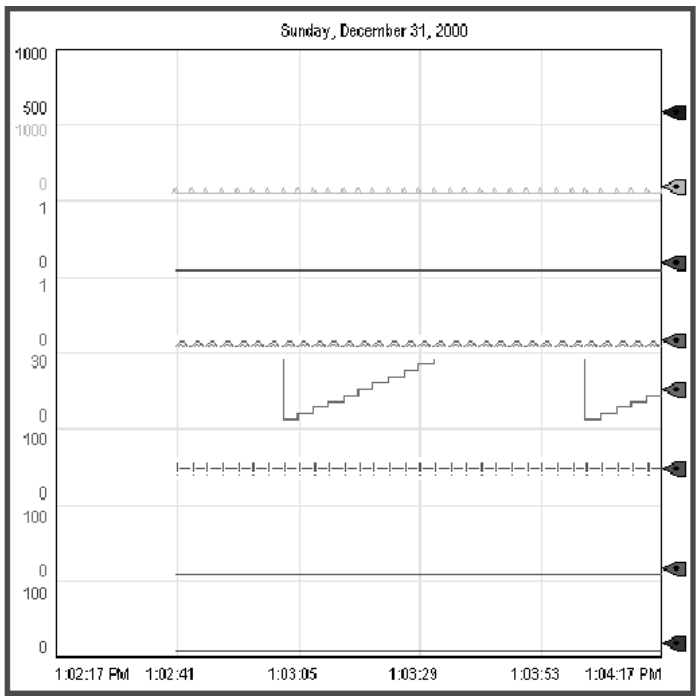


Notice that the horizontal axis labels show the range for the specified x-axis pen. The time period covered by the chart is at the upper left.

Isolated graphing

For charts with multiple pens, you can allow the pen values to overlap, or you can isolate each pen in its own horizontal band on the chart.

This is an example of isolated graphing, with a 10% buffer between each pen's band:



Notice that in this illustration each pen uses its own scale. If desired, you can use the same scale for all pens.

With isolated graphing, a grid line is automatically placed above each pen's band.

Plot a value across the full width of the chart

Use horizontal lines to provide a frame of reference for your tag data. For example, if you define values that are the limits within which a tag must operate, and show horizontal lines in your trend to indicate the limits, when a tag crosses one of these limits the tag's alarm condition is obvious on the trend.

There are two ways to plot a value across the full width of the chart:

- In the **Connections** tab, assign a constant value to a pen.

  When values for the pen have been plotted across the full width of the chart, the pen appears as a solid line.

- In the **Connections** tab, assign to a pen the tag, expression, or constant whose value will be used to determine the position of the line, and then in the **Pens** tab, choose the pen type **Full Width**.

  As soon as the trend is shown, the pen appears as a horizontal line across the full width of the chart. Its vertical position is determined by the tag, expression, or constant's value. If the value changes, the position changes.

Choose trend colors, fonts, lines, and markers

The following table summarizes where in the **Trend Object Properties** dialog box to specify colors, fonts, lines, and markers for a trend.

You can also specify these settings in the **Properties** tab of the **Property Panel**.

To specify this	Use this box or column	In this tab
Chart background color	Background color	Display
Horizontal label color	Text color	Display
Text font, style, and size	Font (button)	Display
Pen line, pen marker, pen icon, and vertical label color	Color	Pens
Pen line width	Width	Pens
Pen line style	Style	Pens
Pen marker	Marker	Pens
Vertical grid line color	Grid color	X-Axis
Horizontal grid line color	Grid color	Y-Axis

The trend border color

The trend border uses the highlight color for the graphic display, specified in the **Behavior** tab of the **Display Settings** dialog box.

The trend window color

By default, the trend window uses the background color of the display, specified in the General tab of the **Display Settings** dialog box.

To use a different window color

- In the **Property Panel**, select the opaque WindowStyle, and then specify the WindowColor property.

For information about using the **Property Panel**, see Use the Property Panel on page 360.

Test the trend

You can quickly test the trend by switching to test mode. If communications are active and there is data for the tags, the pens plot values in the trend. When you are finished testing, switch back to edit mode to continue editing.

To switch between test and edit modes

- From the **View** menu, select **Test Display** or **Edit Display**, or click the Test Display tool , or the Edit Display tool .

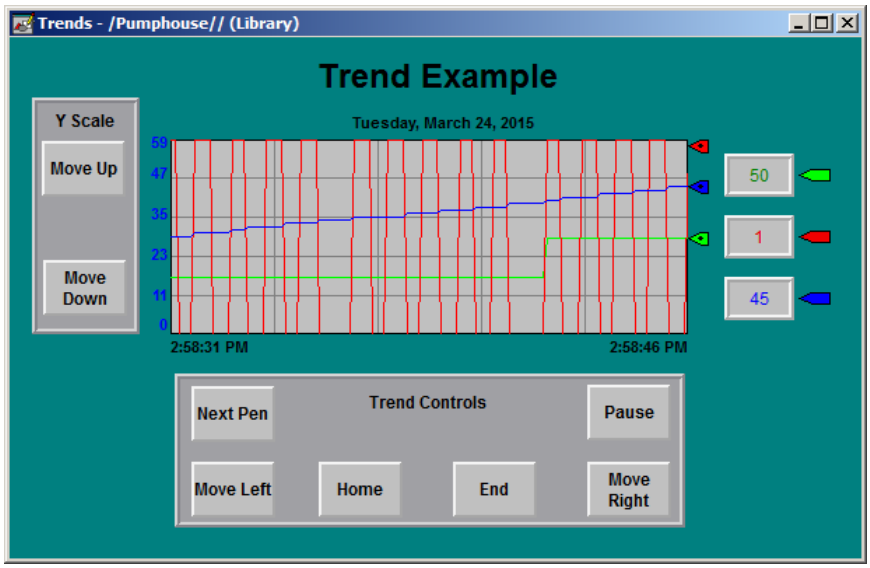
  Note: Test mode is not the same as running the display. Test mode does not change the appearance or position of the display as set up in the **Display Settings** dialog box. Also, data logging is not turned on in test mode.

Use the Trends graphic library

The Trends graphic library contains a trend graphic object and buttons for controlling the trend. It also contains numeric display objects that show the value of each tag used in the trend.

You can use the trend and objects as they are, or you can edit them to suit your needs. To use the objects, drag and drop (or copy and paste) them into your graphic display.

For information about copying and pasting objects from the graphic libraries, see Copy and paste objects on page 374.



To use the Trends graphic library

1. Open the **Graphics** folder, and then open the **Libraries** folder.
2. Double-click the **Trends** library.
3. Drag and drop or copy and paste objects into your display.

Use buttons to control the trend at run time

You can use button graphic objects with the trend, to allow the operator to pause the trend, switch between pens, or scroll the trend. You can link buttons to a specific trend object, or set up a button to work with whichever object is selected in the graphic display. For information about linking buttons to objects, see Link buttons to objects on page 397.

Use these buttons with trends:

This button	Does this
Pause	Toggles between pausing and automatic scrolling. When the trend is paused, the pen icons continue to move vertically to indicate the pens' current values. When the trend resumes scrolling, values that occurred while the trend was paused are filled in, bringing the trend up to the current time (unless you are scrolling historical data).
Next pen	Changes the vertical axis labels to the scale for the next pen. The color of the labels matches the color of the selected pen.
Move up	Scrolls up to show higher values on the vertical scale. For example, if the visible scale range is 0 to 100, pressing move up could change the visible range to 10 to 110. The incremental amount the axis scrolls depends on the pen's range and the number of horizontal grid lines. This button does not work if the **Minimum / maximum value** option in the **Y-Axis** tab is set to **Automatic**.
Move down	Scrolls down to show lower values on the vertical scale. This button does not work if the **Minimum /maximum value option** in the **Y-Axis** tab is set to **Automatic**.
Move left	Pauses the trend and scrolls to the left.
Move right	Pauses the trend and scrolls to the right.
Home	Pauses the trend and moves to the earliest data in the trend.
End	Resumes trend scrolling and moves to the current (latest) data in the trend.

To see how the buttons work with the trend, open the Trends graphic library (see Use the Trends graphic library on page 544), and start test mode.

For information about creating buttons, see Use graphic objects on page 331. For details about setting up the buttons, see Set up buttons on page 403.

Print trend data

To print trend data at run time, provide the operator with a method for printing the graphic display.

You can use these methods to print graphic displays at run time:

- Create a display print button. For information about creating graphic objects, see Use graphic objects on page 331.
- Assign a tag or expression to the **Remote Display Print** connection (in the **Global Connections** editor). When the value of the tag or expression changes from 0 to a non-zero value, the current display is automatically printed.

  Program the data source to trigger the change as often as you want the data printed.

  For more information about setting up remote display printing, see Set up global connections on page 111.

Everything on the screen is printed, including the current display, pop-up windows, and any visible background applications.

For information about specifying which printer to use at run time for applications that will run on a personal computer, see Specify the printers to use at run time on page 238.

For information about specifying printer options for applications that will run on a PanelView Plus 7, PanelView Plus 6, PanelView Plus, PanelView Plus Compact, or PanelView Plus CE terminal, see the *PanelView Plus Terminals User Manual*.

Improve clarity of the trend printout

Depending on what type of printer you use, pen lines with a width of 1 pixel might not appear in the printout. Choose high-contrast colors and wider line widths to ensure that the trend data prints clearly.

Runtime errors for the trend

If data for the trend is not available at run time due to communication errors, a message is sent to FactoryTalk Diagnostics.

See Help for information about solving common trend problems.

Set up RecipePlus

This chapter describes:

- What recipes are
- Summary of steps for creating a recipe system
- How the recipe system works
- Specify the runtime location of recipe files
- Create recipe files
- Compare recipes
- Create **RecipePlus** buttons, selectors, and tables
- Test **RecipePlus** objects
- Use objects from the **RecipePlus_Components** graphic library
- Use buttons with the recipe objects
- View data values that are saved at run time

About recipes

A recipe is a set of numeric and string data values (ingredients) that can be downloaded to their associated tags at the data source. Each ingredient has a pre-set data value assigned to it. The set of data values for all the ingredients in a recipe is called a data set. The set of numeric and string tags assigned to the ingredients in the recipe is called a tag set. The ingredients, data sets, and tag sets are stored together in a recipe file.

You can create different pairs of data sets and tag sets for the same set of ingredients. Each pairing of data set with tag set is called a unit. Each unit is like a unique recipe. At run time, the operator can select the unit (recipe) that applies to the current operation.

For example, a bakery making whole wheat bread could use the same ingredients and tag sets, but depending on the type of crust desired, could use different data sets to specify different baking temperatures. As another example, you might want to have multiple production lines baking the same bread. In this case, the data set for all the production lines would be the same, but the tags receiving the recipe information would be different for each production line. Units allow you to combine different tag sets and data sets for the same set of ingredients.

The FactoryTalk View RecipePlus system allows you to create up to 15,000 ingredients, 500 data sets, 50 tag sets, and 2,500 units for each recipe file.

You can create data sets at development time, edit them at run time, and also create new data sets from tag values at run time. You can write the data set values to tags, or write tag values to data sets.

The RecipePlus system can be used for manufacturing food and beverages, but it can also be used for any application where you want to show, edit, download, or save multiple values at once. For example, recipes are used in the petrochemical and pharmaceutical industries. In the pharmaceutical industry, you could use recipes to design flexible packaging, creating recipes that specify the number of tissues to put in a box or the number of milliliters of shampoo to put in a bottle.

Steps for creating a recipe system

Follow these steps to create a recipe system:

1. In the **RecipePlus Setup** editor, specify the runtime location for recipe files. The files can be stored with the application or in a separate location. For details, see Specify the runtime file location on page 550.

2. In the **RecipePlus Editor**, set up ingredients, data sets, tag sets, and units. You can also specify a percent complete tag and a status tag for the recipe. For details, see Set up recipe files on page 552.

3. Create a display in the **Graphics** editor, containing a **RecipePlus** selector, table, and buttons. For details, see Create RecipePlus objects on page 555.

4. If desired, create key buttons in the same graphic display, to allow the operator to use the selector and table without a keyboard.

   For information about the buttons you can use with recipes, see Use buttons with recipe objects on page 557.

How the recipe system works

A recipe system consists of a recipe file and the graphic objects used to work with the ingredients at run time.

RecipePlus selector

Use the **RecipePlus** selector to select the recipe file and unit to work with.

RecipePlus table

Use the **RecipePlus** table to show the selected recipe file's ingredients, tag values, and data set values. The operator can edit data set values in the table, unless you select the View only option.

If desired, you can include a **Compare** column in the table, to compare tag values to data sets at a glance. If you choose this option, FactoryTalk View

shows an X in the **Compare** column when the tag value and data set value for an ingredient differ. Ingredients with an X are listed first.

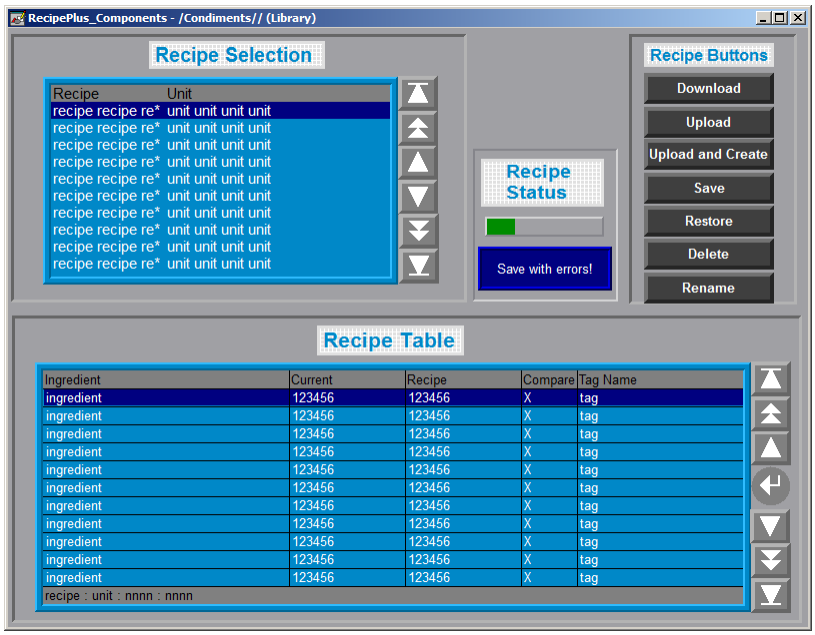
RecipePlus button

Use the **RecipePlus** button to perform actions on the selected recipe's ingredients. The recipe is selected using the **RecipePlus** selector object. Set up a separate **RecipePlus** button for each action you want to perform:

- **Download** — write the data set values to tags, for all the ingredients in the selected recipe.
- **Upload** — write tag values to the data set, for all the ingredients in the selected recipe. If all values are uploaded successfully, the recipe file is saved.
- **Upload and Create** — write tag values for all the ingredients in the selected recipe to a new data set, creating a new unit. The operator is prompted for a name for the new unit. If all values are uploaded successfully, the recipe file is saved.

  The new data set is named Data Set *n*, where *n* is the next available number (starting at 1) that will create a unique data set name.
- **Restore** — show the selected recipe in the **RecipePlus** table.
- **Save** — save the data set values for the recipe file and unit shown in the **RecipePlus** table. If the operator made changes in the data set values using the string pop-up keyboard or numeric pop-up keypad, the new values in the table overwrite existing data set values (if any) for the unit in the recipe file.
- **Delete** — delete the recipe unit selected in the **RecipePlus** selector object.
- **Rename** — rename the recipe unit selected in the **RecipePlus** selector object.

The illustration below shows a graphic library display that contains a **RecipePlus** selector, **RecipePlus** buttons, and a **RecipePlus** table. The display also contains key buttons for working with the selector and table, a bar graph that shows the percentage complete of the recipe operation, and a string display that shows the status of the recipe operation.



Number format

The values in the recipe table are shown using the number format of the current application language. For example, if the application language uses a comma for the decimal symbol, floating-point values in the table use commas for the decimal symbol. For information about using multiple languages, see Set up language switching on page 197.

Numeric limits

RecipePlus supports the range of numbers allowed by the VARIANT data type. This range is -1.797693E+308 to 1.797693E+308. This range applies to the numbers that you enter in the **RecipePlus Editor**, and it also applies to the tag values that are uploaded to the recipe file at run time.

Specify the runtime file location

Use the **RecipePlus Setup** editor to specify the runtime file location.

Store files outside the HMI project

If you store the recipe files outside the HMI project, the runtime application can use updated recipe files without creating a new runtime application (.mer) file.

Storing recipe files outside the HMI project also allows you to use FactoryTalk View Studio to view and edit recipe data that is saved at run time without converting the .mer file to an .med file. For more information, see View data values that are saved at run time on page 558.

Note: If you want to store recipe files outside of the HMI project at run time, make sure you move the files from the application's **RecipePlus** folder to the specified runtime location before running the application.

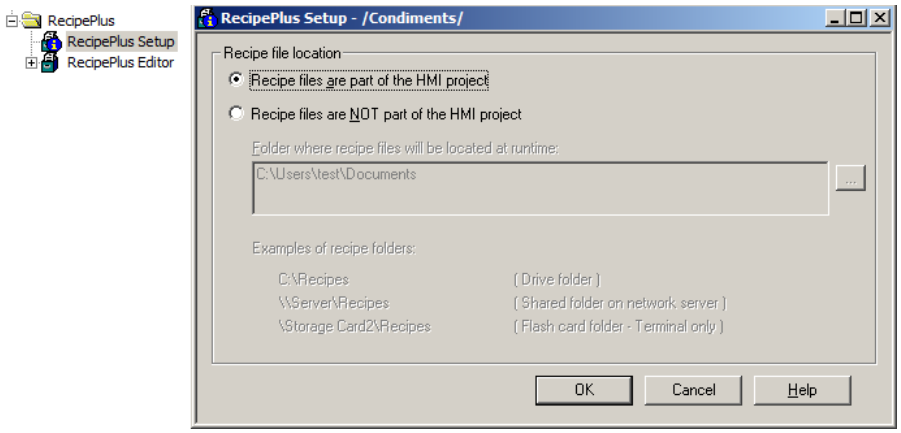
This is the path to the **RecipePlus** folder:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects***Project name***RecipePlus**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects***Project name***RecipePlus**

If recipe files are stored outside the HMI project, when you perform an action on a recipe file at run time, the file is locked until the action is completed. This prevents other users from making changes to a file while you are working with it.

Store recipe files with the HMI project

If recipe files are part of the HMI project, when a recipe file is saved at run time, FactoryTalk View updates the .mer file with changes to the data sets. When you stop the runtime application, the changes are retained, and are shown the next time you run the application and show the recipe file. You can convert the .mer file to an .med file to view the changes in FactoryTalk View Studio. For more information about converting runtime application files, see Convert runtime application files to development applications on page 226.


RecipePlus
RecipePlus Setup
RecipePlus Editor
RecipePlus Setup - /Condiments/
Recipe file location
Recipe files are part of the HMI project
Recipe files are NOT part of the HMI project
Folder where recipe files will be located at runtime:
C:\Users\test\Documents
Examples of recipe folders:
C:\Recipes (Drive folder)
\\Server\Recipes (Shared folder on network server)
\Storage Card2\Recipes (Flash card folder - Terminal only)
OK
Cancel
Help

For details about using the **RecipePlus Setup** editor, see Help.

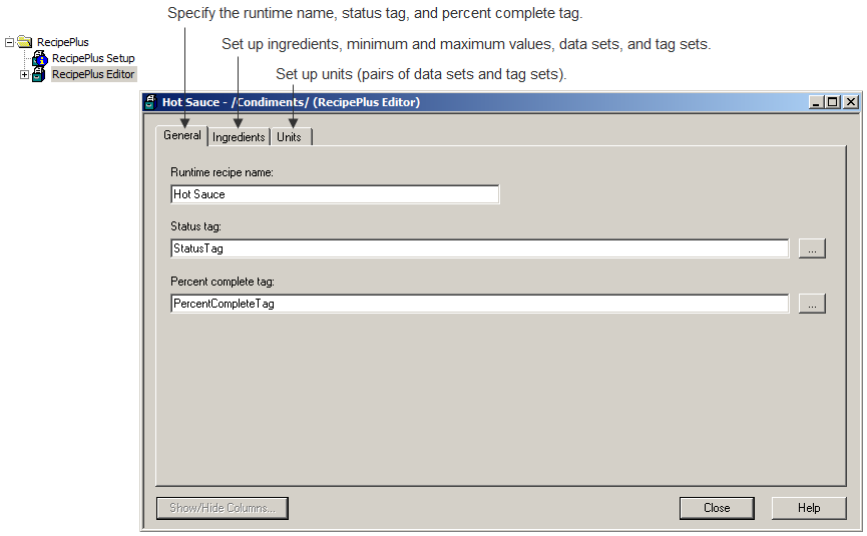
Set up recipe files

Use the **RecipePlus Editor** to set up one or more recipe files. Each file is stored in the editor's folder. You can open and work on multiple recipe files at the same time.

The **RecipePlus Editor** has special items on the **Edit** menu that allow you to easily copy and paste from the spreadsheet in the Ingredients tab to Microsoft Excel. This editor also has items on the Recipe menu, for adding, deleting, and renaming data sets and tag sets, and for comparing recipes.

To help you get started, FactoryTalk View creates one data set, tag set, and unit. You can rename them and assign data values and tags to them, or delete them and create your own.

For information about comparing recipes, see the next section.



For details about the options in the **RecipePlus Editor**, see Help.

Note: You can also use the **RecipePlus Editor** to view the data values that are saved at run time. For more information, see View data values that are saved at run time on page 558.

Compare recipes

You can use the **RecipePlus Editor** to compare data sets and tags sets within a single recipe, or between two recipes.

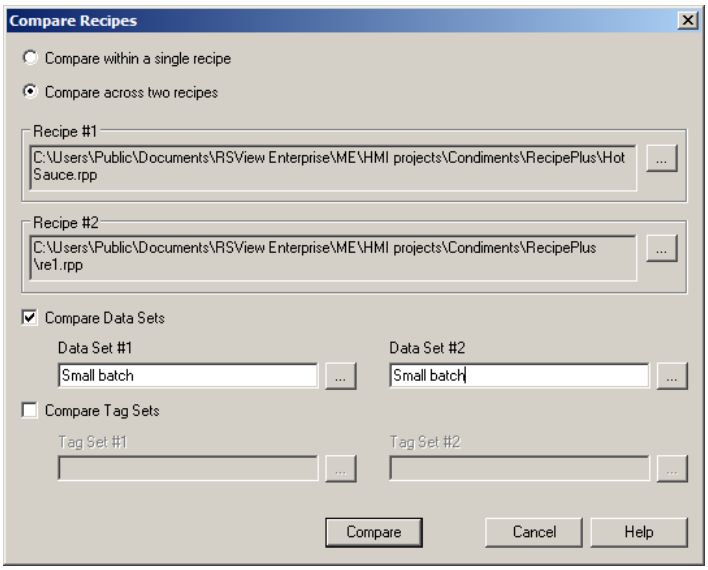
If you are comparing data sets or tag sets within a recipe, only ingredients with different values are shown in the report.

If you are comparing data sets or tag sets between two recipes, both common ingredients and unique ingredients are listed in the report.

To compare recipes

1. Open the **RecipePlus Editor**.

2. From the **Recipe** menu, select **Compare Recipes**.

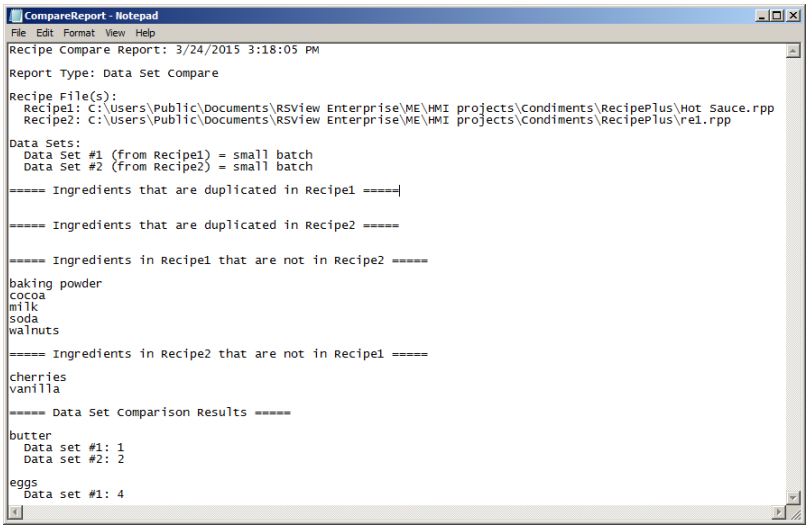


3. Specify the recipe file or files, data sets, and tag sets to compare.

   For information about the options in the **Compare Recipes** dialog box, see Help.

4. Click **Compare**.

   A report is shown in Windows Notepad.


CompareReport - Notepad
File Edit Format View Help
Recipe Compare Report: 3/24/2015 3:18:05 PM
Report Type: Data Set Compare
Recipe File(s):
Recipe1: C:\Users\Public\Documents\RSView Enterprise\ME\HMI projects\Condiments\RecipePlus\Hot Sauce.rpp
Recipe2: C:\Users\Public\Documents\RSView Enterprise\ME\HMI projects\Condiments\RecipePlus\re1.rpp
Data Sets:
Data Set #1 (from Recipe1) = small batch
Data Set #2 (from Recipe2) = small batch
===== Ingredients that are duplicated in Recipe1 =====
===== Ingredients that are duplicated in Recipe2 =====
===== Ingredients in Recipe1 that are not in Recipe2 =====
baking powder
cocoa
milk
soda
walnuts
===== Ingredients in Recipe2 that are not in Recipe1 =====
cherries
vanilla
===== Data Set Comparison Results =====
butter
Data set #1: 1
Data set #2: 2
eggs
Data set #1: 4

Time and date formats

The time and date in the report use the time and short date format for the current application language. For information about using multiple languages, see Set up language switching on page 197.

Print recipes

You can use the **RecipePlus Editor** to print recipe data sets. For information about printing from editors, see Print on page 51.

Create RecipePlus objects

You can create one **RecipePlus** table and **RecipePlus** selector per graphic display. You can create multiple **RecipePlus** buttons in a display, with a different action assigned to each.

The objects and button actions to use depend on how you want to use your recipe system. For example, if you just want to write data set values to tags, all you need is a **RecipePlus** selector and a **RecipePlus** button with the download action. For information about how the different objects in the recipe system work, see How the recipe system works on page 548.

To create a recipe object

1. In the **Graphics** editor, create or open a graphic display.
2. Select a **RecipePlus** drawing tool by doing one of the following:
   - In the **Objects** toolbox, click the **RecipePlus Button**, **RecipePlus Selector**, or **RecipePlus Table** tool.
   - From the **Objects** menu, select **RecipePlus**, and then click **RecipePlus Button**, **RecipePlus Selector**, or **RecipePlus Table**.
3. Drag the mouse to create a box approximately the size you want for the object.
4. Double-click the object to open its **Properties** dialog box.
5. Set up the object. For details, see Help.

Once you have set up a **RecipePlus** object, you can edit it as you would any other graphic object. You can move it, resize it, attach animation to it, and so on. You can also use the object in other graphic displays by dragging it from one display and dropping it into another.

For more information about graphic objects, see Use graphic objects on page 331.

Test RecipePlus objects

You can quickly test the recipe objects in a display by switching to test mode. If communications are active and there is data for the tags, you can download and upload recipe tag values. When you are finished testing, switch back to edit mode to continue editing.

To switch between test and edit modes

- From the **View** menu, select **Test Display** or **Edit Display**, or click the Test Display tool , or the Edit Display tool .

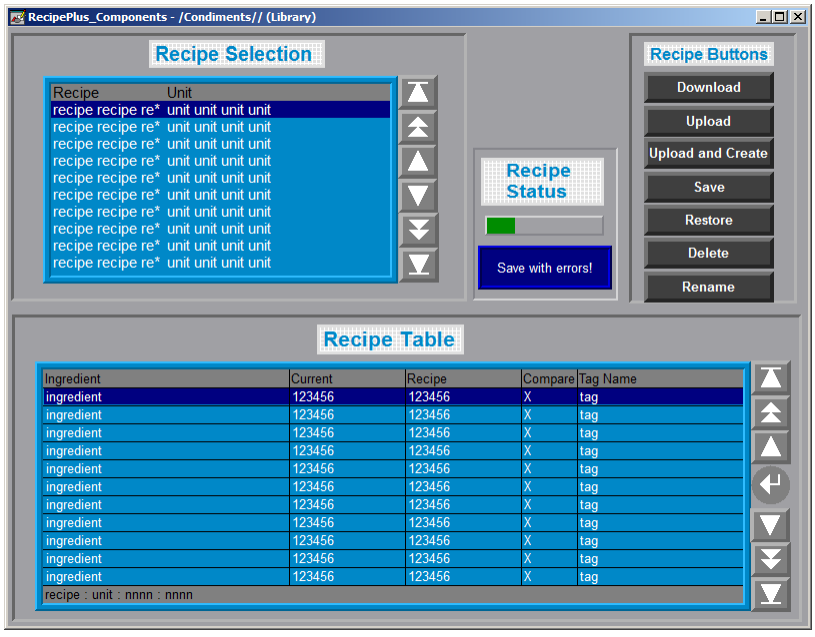
  Note: Test mode is not the same as running the display. Test mode does not change the appearance or position of the display as set up in the **Display Settings** dialog box. Also, data logging is not turned on in test mode.

Use the RecipePlus_Components graphic library

The **RecipePlus_Components** graphic library contains a **RecipePlus** selector and table and buttons for working with the objects. It also contains a bar graph and multistate indicator that show the status of recipe operations.

Use test mode to see how the different **RecipePlus** objects work together. In test mode, the **RecipePlus** selector in the library shows any recipe files and units that you have created in your application.

You can use the objects in the library as they are, or you can edit them to suit your needs. To use the objects, drag and drop (or copy and paste) them into your graphic display. For information about copying and pasting objects from the graphic libraries, see Copy and paste objects on page 374.



To use the RecipePlus_Components graphic library

1. Open the **Graphics** folder, and then open the **Libraries** folder.
2. Double-click the **RecipePlus_Components** library.
3. Drag and drop or copy and paste objects into your display.

Use buttons with recipe objects

You can use button graphic objects with the **RecipePlus** selector and table, to select the recipe and unit to work with, and to select ingredients in the table.

You can link buttons to a specific recipe object, or set up a button to work with whichever object is selected in the graphic display. For information about linking buttons to objects, see Link buttons to objects on page 397.

Use these buttons with recipe objects:

This button	Does this
Move up	Moves the highlight bar up one item in the list.
Move down	Moves the highlight bar down one item in the list.
Page up	Moves the highlight bar up one page in the list.
Page down	Moves the highlight bar down one page in the list.
Home	Moves the highlight bar to the top item in the list.
End	Moves the highlight bar to the bottom item in the list.
Enter (table only)	Opens the numeric keypad or string keyboard for the operator to edit the data set value. If a numeric ingredient has a minimum and maximum value defined, these values are shown in the numeric keypad. If the table is defined as View only, the operator cannot edit it.

To see how the buttons work with the **RecipePlus** selector and table, open the **RecipePlus_Components** graphic library (see Use the RecipePlus_Components graphic library on page 556), and start test mode.

For information about creating buttons, see Use graphic objects on page 331. For details about setting up the buttons, see Set up buttons on page 403.

Example: Edit and downloading recipe values at run time

This example shows how to use the **RecipePlus** graphic objects to edit and download recipe values at run time.

1. In the **RecipePlus** editor, create a **RecipePlus** file containing ingredients, several data sets, a tag set, and several units combining the different data sets with the tag set.
2. Open the **RecipePlus_Components** library.
3. Start test mode.
4. Use the move up and move down buttons next to the **RecipePlus** selector to highlight a unit in the selector, and then press the **Restore** button.

   The unit's ingredients are shown in the **RecipePlus** table, with the data set values in the **Recipe** column.
5. Use the move up and move down buttons next to the **RecipePlus** table to select an ingredient, and then press the **Enter** button.

   The numeric pop-up keypad opens, showing the minimum and maximum values for the ingredient. If the ingredient is a string ingredient, the string pop-up keyboard opens.
6. Type a new value for the ingredient, and then press Enter.

   The new value is shown in the **Recipe** column.
7. Press the **Save** button to save the new value.
8. Press the **Download** button to write all the values in the Recipe column to the tags associated with the ingredients.

   The values are downloaded to the data source.

View data values that are saved at run time

Use the **RecipePlus Editor** in FactoryTalk View Studio to view data values that have been saved at run time.

The operator can save tag values at run time by uploading to an existing data set or to a new data set. The operator can also edit data set values in the **RecipePlus** table and save the edited values (unless the table is View only).

If recipe files are stored with the HMI project, changes are saved in the .mer file. To view the changes in FactoryTalk View Studio, convert the .mer file to an .med file. For more information about converting the runtime application file, see Convert runtime application files to development applications on page 226.

To view data values in modified recipe files

1. If recipe files are stored outside of the HMI project, do one of the following:

   - Add the recipe file (*.rpp) that you saved at run time into the application using Add Component Into Application (for details, see Add components into an application on page 295).
   - If the recipe file already exists in the application, you can just copy the modified file back into the application's **RecipePlus** folder. (For the path to the **RecipePlus** folder, see Store files outside the HMI project on page 551.)

2. If recipe files are stored with the HMI project, and you have not already done so, convert the runtime application file to a development application, as described on Convert runtime application files to development applications on page 226.

3. In the Explorer window in FactoryTalk View Studio, double-click the modified recipe file.

   The **RecipePlus Editor** opens.

4. Click the **Ingredients** tab.

5. If the data set you want to view is not visible, scroll right to see more data sets.

Use macros

This chapter describes:

- Use macros to assign values to tags
- Use the **Macros** editor
- When to use macros
- Running macros when tags or expressions change value
- Where to assign macros

Use macros to assign values to tags

A macro is a list of tag assignments stored in a text file, in the format <tag>=<value>. Each assignment assigns a value to a tag. The value can be in the form of another tag, an expression, a numeric constant, or a string.

Examples: Use macros to set tag values

Tag1 = 8
Sets the value of Tag1 to 8.

Tank1\Message = "Tank1 overflow"
Sets the string tag Tank1\Message to Tank1 overflow.

Tag1 = Tag2
Sets the value of Tag1 to be the same as Tag2.

Tag1 = Tag1 + 1
Increases the value of Tag1 by 1.

Tag1 = if (Tag2 < Tag1) then 4 else 3
Performs the if-then-else calculation and stores the result in Tag1.

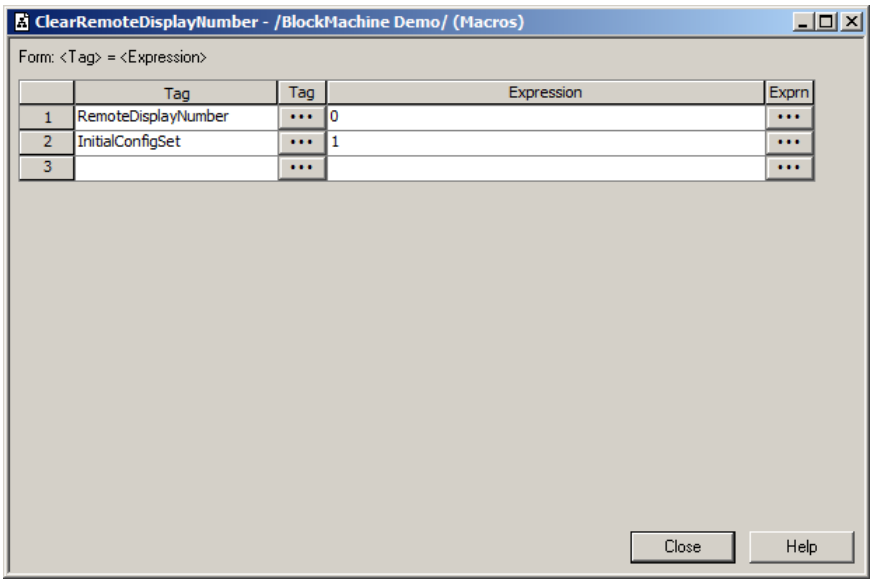
1Pump = {Industry-2} + {2Pump}
Adds the values of Industry-2 and 2Pump and stores the result in 1Pump.

Brackets surround Industry-2 because of the dash in the name. Brackets surround 2Pump because the name starts with a number. No brackets are used for 1Pump because this name is on the left side of the equal sign.

For more information about expression syntax, see Use expressions on page 475.

Use the Macros editor

Use the **Macros** editor to create macros.



For details about using the **Macros** editor, see Help.

When to use macros

You can assign macros to run when:

- The application starts or shuts down.
- A graphic display opens or closes.
- A user logs in or out. Macros can be assigned to individual users and to groups of users.
- A specified tag or expression changes to a new non-zero value (using global connections).
- An operator presses a Macro button.

At run time, when the macro runs, the values are sent to the tags at the data source.

Note: At run time, the tag assignments are executed asynchronously. That is, the system does not wait for the completion of one tag assignment before executing the next. Therefore, do not rely on the order of assignments to control your process.

Run macros when tags or expressions change value

You can use global connections to run macros when tags or expressions change value. This means you can use the data source to trigger the macro to run.

FactoryTalk View allows you to create up to five macros for use with global

connections. The macros must be named Macro1, Macro2, Macro3, Macro4, and Macro5 in order to work with global connections.

For more information about global connections, see Set up global connections on page 111.

Example: Use macros to reset tag values

This example shows you how to run a macro whenever the operator needs to reset production information tags to known values.

The macro writes the desired values to the tags whenever the operator presses a Momentary push button.

1. Create a memory tag called *ResetProdData*.
2. Create a **Momentary** push button with the caption *Reset Production Data*. Assign the **ResetProdData** tag to the **Value** connection.
3. Create a macro called *Macro1*, with these tag assignments:

   TotalProductionUnits=0
   LineDownTime=0
   TotalRejects=0

4. In the **Global Connections** editor, assign the **ResetProdData** tag to the **Remote Macro1** connection.

When the operator presses the **Reset Production Data** button, the value of the **ResetProdData** tag changes from 0 to 1. This tells FactoryTalk View to run Macro1, which writes the specified values to the tags in the macro.

Where to assign macros

Once you have created the macros you want to use, assign the macros in these editors:

In this editor	Do this
Startup	Assign application startup and shutdown macros.
Graphics	Assign macros to run when displays open or close, using the **Display Settings** dialog box.
Runtime Security	Assign macros to run when users log in and log out. Macros that you assign to groups of users run each time any member of the group logs in or logs out.
Global Connections	Specify the tags or expressions that will run the macros named Macro1 to Macro5.

Convert PanelBuilder 1400e applications

This appendix describes:

- Terms that are different in PanelBuilder 1400e and FactoryTalk View
- Steps for converting PanelBuilder 1400e applications
- Names of equivalent graphic objects in the two products
- PanelBuilder 1400e graphic objects that are not supported in FactoryTalk View
- PanelBuilder 1400e settings and controls that are not supported in FactoryTalk View
- How communications are converted and which PanelBuilder 1400e communication protocols are not supported in FactoryTalk View
- Convert PanelBuilder 1400e Remote I/O communications
- PanelBuilder 1400e graphic object features that are not supported in FactoryTalk View, with information about how to achieve the same result when possible
- Convert PanelBuilder 1400e expressions

PanelBuilder 1400e applications are applications you create using PanelBuilder 1400e Configuration Software for Windows. For information about converting applications from PanelBuilder or PanelBuilder32, see Convert PanelBuilder and PanelBuilder32 applications on page 581.

Note: You can convert PanelView 1200 applications to PanelBuilder 1400e applications, and then convert the PanelBuilder 1400e applications to FactoryTalk View Machine Edition applications.

Terminology

These terms are different in PanelBuilder 1400e and FactoryTalk View.

PanelBuilder 1400e term	FactoryTalk View term
screen	display, graphic display
Optional Keypad Write Expression	Optional Expression
programmable controller	data source

PanelBuilder 1400e term	FactoryTalk View term
control	connection

In FactoryTalk View, the data source can be memory or a device such as a programmable controller or an OPC server. FactoryTalk View writes values to and reads values from the data source. The data source is configured to exchange information (in the form of numeric or string values) between FactoryTalk View and the machine that your application is controlling. The general term data source is used unless specifically discussing a programmable controller.

Steps for converting PanelBuilder 1400e applications

Follow these steps to convert PanelBuilder 1400e applications:

1. Prepare the application in PanelBuilder 1400e, and then convert the application file, as described in the next section.
2. Specify additional project settings, as described on About project settings on page 72. For example, if you want the application to have a border around its graphic displays, or to use a title bar, you can specify these options in the **Project Settings** editor.

   Note: We recommend that you use the **Project Settings** editor to change the project window size, rather than using the **Convert to new window size** option in the Machine Edition Import Wizard.

3. If you use the **Convert to new window size** option in the Machine Edition Import Wizard, check the position of the graphic objects in each display.
4. Set up communications and edit tags that don't convert directly.

   For more information, see Convert non-RIO communications on page 587.

5. Set up graphic object features that don't convert directly.

   For more information, see Unsupported graphic object features on page 576.

6. Check each expression you used in PanelBuilder 1400e.

   For more information, see Convert expressions on page 578.

7. If you are going to use a printer at run time, set it up for Ethernet or USB printing. Adjust the printer settings on the PanelView Plus or PanelView Plus CE terminal.

   For information about setting up printers on the terminal, see the *PanelView Plus Terminals User Manual*.

Convert PanelBuilder 1400e application files

Follow these steps to convert a PanelBuilder 1400e application file, with the extension .pvc, to an FactoryTalk View application file, with the extension .med. The original PanelBuilder 1400e application file is not modified by the conversion.

For information about converting RIO applications, see Convert RIO communications on page 574.

Steps to take in PanelBuilder 1400e before you convert the application

1. Delete the Pass-Through file assignment. FactoryTalk View Studio does not support pass-through file transfers.
2. Make sure the block transfer file numbers are sequential without gaps. If necessary, renumber the block transfer file numbers so there are no missing numbers. Tag addresses in the application will change automatically to match the new number.
3. Save the application.

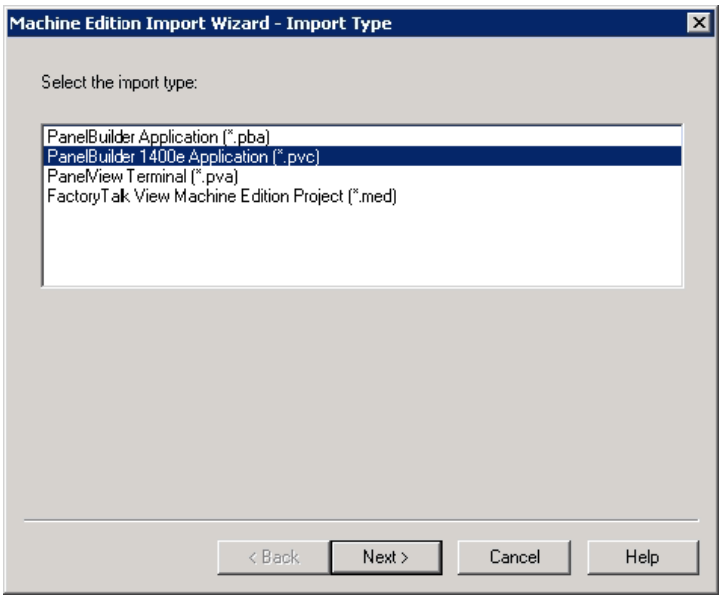
You can convert the PanelBuilder 1400e application when you open FactoryTalk View Studio, or once FactoryTalk View Studio is already open.

To convert a PanelBuilder 1400e application when you open FactoryTalk View Studio

1. Open FactoryTalk View Studio.
2. In the **New** tab, in the **Application name** box, type a name for your converted application, up to 32 characters long.
3. If desired, type a description of the application.

   If the PanelBuilder 1400e application contains an Application File Comment, the Application File Comment will overwrite the description you type here. You can add or change the description later, as described on View application properties on page 77.
4. Specify a language for the converted application. For information about using different languages, see Set up language switching on page 197.

5. Click **Import**.



6. Follow the steps in the Machine Edition Import Wizard.

   For details about the options in the Machine Edition Import Wizard, see Help.

When you complete the steps of the wizard, FactoryTalk View Studio converts the PanelBuilder 1400e application, creates the converted application's folders and files, and then shows the converted application in the Explorer window in FactoryTalk View Studio.

If there are any messages about conversion, they are shown automatically in the **Project Status** dialog box.

The converted application is created in the **ME\HMI projects** directory, in a folder with the same name as the application name you specified in step 2.

This is the path to the ME\HMI projects directory:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects**

Conversion messages are saved in a file called Convert.log, in the HMI projects directory.

To convert a PanelBuilder 1400e application when FactoryTalk View Studio is already open

1. From the **File** menu, select **New Application**, or click the New Application tool .

   If an application is already open, FactoryTalk View Studio asks you whether to close the application that is currently open. Click **Yes**.

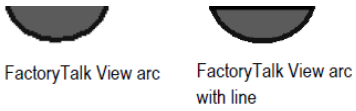
2. Follow steps 2 through 7 in the previous procedure.

Equivalent graphic objects

This section describes graphic objects that are equivalent in PanelBuilder 1400e and FactoryTalk View, but have different names in the two products.

This PanelBuilder 1400e object	Is converted to this FactoryTalk View object	Notes
Increment Value Button	Ramp button	During conversion the button is set up to increment.
Decrement Value Button	Ramp button	During conversion the button is set up to decrement.
Increment Value Button with Display	Ramp button and numeric display	The Increment Value Button with Display is divided into two separate FactoryTalk View objects.
Decrement Value Button with Display	Ramp button and numeric display	The Decrement Value Button with Display is divided into two separate FactoryTalk View objects.
ASCII Input (small and large)	String Input Enable button	
Numeric Entry Keypad (small and large)	Numeric input enable button	
Screen List Selector's list	Display list selector	The PanelBuilder 1400e Screen List Selector is divided into four separate FactoryTalk View graphic objects.
Screen List Selector's Enter Key	Enter button	
Screen List Selector's Down Cursor	Move down button	
Screen List Selector's Up Cursor	Move up button	
Control List Selector's list	Control list selector	The PanelBuilder 1400e Control List Selector is divided into four separate FactoryTalk View graphic objects.
Control List Selector's Enter Key	Enter button	

This PanelBuilder 1400e object	Is converted to this FactoryTalk View object	Notes
Control List Selector's Down Cursor	Move down button	
Control List Selector's Up Cursor	Move up button	
Screen Select Keypad (small and large)	Display list selector	Specify the graphic displays that the display list selector can open.
Screen Keypad Enable Button	Display list selector	Specify the graphic displays that the display list selector can open.
Goto Screen Button	Goto display button	
Return to Previous Screen Button	Return to display button	
ASCII Display	String display	
Numeric Keypad Enable Button	Numeric input enable button	
Normally Open Momentary Push Button	Momentary push button	During conversion the button is set up to be normally open.
Normally Closed Momentary Push Button	Momentary push button	During conversion the button is set up to be normally closed.
Screen Print Button	Display print button	
Alarm History Sort By Time/Sort By Value Button	Sort alarms button	
Alarm Status Reset Qty/Time Button	Reset alarm status button	
Alarm Panel	Alarm banner	
Single Line Alarm Window	Alarm banner	
Alarm Status Screen	Alarm status list	
Clear All Button	Clear alarm history button	
Print Button (in Alarm History screen)	Print alarm history button	
Print Button (in Alarm Status screen)	Print alarm status button	
Alarm Status Button/Alarm History Button	Goto display button	
Exit Button	Close display button	
Alarm History List	Alarm list	
Display Mode Button	Alarm status mode button	

This PanelBuilder 1400e object	Is converted to this FactoryTalk View object	Notes
Time Display	Time and date display	During conversion the display is set up to show the time only. The PanelBuilder 1400e time format is not converted. For details about the FactoryTalk View time format, see Time, date, and number formats for graphic objects on page 403.
Date Display	Time and date display	During conversion the display is set up to show the date only. The PanelBuilder 1400e date format is not converted. For details about the FactoryTalk View date format, see Time, date, and number formats for graphic objects on page 403.
Arc (with solid fill style)	Arc (with solid back style) and line	The line graphic object is added because the solid FactoryTalk View arc shape does not have a line between the two points of the arc.  FactoryTalk View arc FactoryTalk View arc with line

Unsupported graphic objects

These PanelBuilder 1400e objects are not supported in FactoryTalk View:

- Scrolling List (includes Cursor List, Multistate Indicator Object List, Local Message Object List, Numeric Data Display Object List)
- Set Bit Cursor Point

Unsupported settings and controls

This section describes PanelBuilder 1400e settings and controls that are not used in FactoryTalk View.

Controls for transferring runtime application files

PanelBuilder 1400e uses these optional controls for transferring files to the runtime terminal:

- Transfer Inhibit control
- Transfer Request control
- Transfer Status control

These controls are not necessary in FactoryTalk View because the ME Transfer Utility allows you to transfer the runtime project file while running a project on the runtime terminal.

Settings and controls for alarms

FactoryTalk View does not use these PanelBuilder 1400e features and settings to manage alarms:

- Alarm relays
- Bit alarm acknowledgement
- Remote Alarm Operation Hold Time. The PanelBuilder 1400e Remote Alarm Ack Control Hold Time will be used for all alarm hold times. You can change the hold time in the FactoryTalk View **Alarm Setup** editor, in the **Advanced** tab.
- Remote Alarm Control Delay Time. In FactoryTalk View, if an **Ack** connection is assigned, when an alarm is acknowledged the **Ack** connection is set immediately, without waiting for a delay time.

FactoryTalk View does not use these PanelBuilder 1400e controls to manage alarms:

- PLC Controlled Relay control
- PLC Controlled Audio control
- Acknowledge to PLC control (if the Alarm Acknowledge to PLC option is set to Bit)

Invalid characters in screen names

Characters in PanelBuilder 1400e screen names that are not supported in FactoryTalk View are replaced with the underscore character.

Screen security settings

PanelBuilder 1400e screen security settings are not converted, because FactoryTalk View uses a different method to assign security to graphic displays. For information about setting up security in FactoryTalk View, see Set up security on page 175.

Block tags

Block tags are not supported in FactoryTalk View. Block tags that are monitored for alarms in your PanelBuilder 1400e application are converted to bit arrays. For information about monitoring bit arrays for alarm conditions, see Set up alarms on page 119.

Convert non-RIO communications

This section describes how communications that do not use Remote I/O (RIO) are converted.

FactoryTalk View does not use nodes for communications. Nodes are converted to RSLinx topics. Topics are then converted into device shortcuts, to run with RSLinx Enterprise. You must have both RSLinx Classic and RSLinx Enterprise installed to make this two-step conversion.

Tags are converted to HMI device tags and RSLinx aliases. The Unsolicited_Msgs node is not converted.

If you import an application multiple times, delete the device shortcuts in RSLinx Enterprise before re-importing. Otherwise, multiple unused device shortcuts will be created in RSLinx Enterprise.

For more information about setting up communications, see Set up communications on page 79.

For information about converting RIO communications, see Convert RIO communications on page 574.

Unsupported tag data types

These tag data types are not supported in FactoryTalk View:

- Bit Position
- 1-BCD, 2-BCD, 5-BCD, 6-BCD, 7-BCD, 8-BCD
- BIN3, BIN4, BIN6, BIN8 (used with Modbus communications)

Tags that use these data types are converted to analog HMI tags with the Default data type. The Default data type uses floating point values.

For **Bit Position** data types, use the bitwise expression operators to show data that does not reference supported lengths. For more information, see the Rockwell Automation KnowledgeBase.

To open the KnowledgeBase

- In FactoryTalk View Studio, on the Help menu, select Rockwell Software on the Web, and then click **Rockwell Automation KnowledgeBase**.

For information about using bitwise expression operators, see Bitwise operators on page 482.

Unsupported initial values

Device tags in FactoryTalk View do not use initial values. Memory tags are converted with their initial values.

Convert RIO communications

You can use Remote I/O (RIO) communications on the PanelView Plus, and PanelView Plus CE runtime platforms.

Note: For PanelView Plus 7 and PanelView Plus 6 terminals, you need a third party RIO to Ethernet gateway module for RIO communications. For more information, see Answer ID 490889 in Rockwell Automation Knowledgebase.

RIO communications are not supported for the applications that run on a personal computer. However, you can test run your RIO applications on the development computer.

To convert an RIO application from PanelBuilder 1400e to FactoryTalk View

1. Convert the application.

   For more information, see Convert PanelBuilder 1400e application files on page 567.

2. Open the RSLinx Enterprise data server, and then double-click **Communication Setup**.

3. In the **Communication Setup** editor, add an RIO driver.

   - For PanelView Plus 400 and 600 terminals, use the 2711P-RN1 driver.
   - For all other PanelView Plus or PanelView Plus CE terminals, use the 2711P-RN6 driver.

   For information about adding drivers in RSLinx, see RSLinx Help.

4. Expand the RIO tree, right-click RIO Data, and then click **Configure RIO**.

5. In the **RIO Configuration** dialog box, right-click RIO, and then click **Import**.

6. Browse to the location of the RIO configuration file.

The file is saved in the root of the application's directory.

7. In the **Communications** Setup editor, create a device shortcut that points to the RIO data device.

   For information about creating a device shortcut, see RSLinx Help.

8. Apply the shortcut to the RIO driver.

9. Correct any invalid RIO configurations. Invalid RIO configurations are highlighted with red "x" icons.

   Note: If red "x" icons appear after you import the RIO .xml file, you can fix block tags in the Communication Setup editor in FactoryTalk View. The length of block tags must be the same for Read and Write pairs sharing the same rack, group, and slot.

10. Create an alias for any data that is not a 16-bit integer or bit.

11. Save the converted RIO application.

Important:	RIO configurations are not saved with the application when you exit FactoryTalk View Studio. However, they are backed up with the application in the Application Manager. For information about handling multiple applications with different RIO settings, see the Rockwell Automation KnowledgeBase. For information about using the Application Manager, see Rename, copy, delete, back up, and restore applications on page 71.

Unsupported PanelBuilder 1400e RIO tags

A PanelBuilder 1400e RIO tag will be converted to an HMI memory tag and an error will be logged to the conversion log file if the RIO tag:

- Has a blank address.
- Has a data type of 1-BCD, 2-BCD, 3-BCD, 5-BCD, 6-BCD, or 7-BCD.
- Has a data type of Bit Position and its address does not reference a single bit.
- Float has a data type of Float and its address has a bit offset assigned that is not 0.
- Has a data type of Long Integer or 8 Digit BCD, its address has a bit offset assigned that is not 0, and its length or range is greater than (32 - *Start Bit*).
- Has a tag type of Block.

- Has an invalid PanelBuilder 1400e address or references an undefined rack.

Unsupported graphic object features

This section describes features of PanelBuilder 1400e graphic objects that are not supported in FactoryTalk View. The Notes column provides additional information and describes methods for achieving the same result when possible.

Graphic object	Unsupported feature in FactoryTalk View	Notes
Image text, arc, ellipse, line, panel, rectangle, wedge	Blinking wallpaper objects	If you want an object to blink at run time, unlock the wallpaper. In FactoryTalk View, all of the listed objects except images use color animation to blink. For details, see Set up color animation on page 465. Color images do not blink. Monochrome images use the **Blink** property to blink.
Numeric Display	Polarity	If a PanelBuilder 1400e application was set up with the Polarity control requiring a negative number to show the minus sign, the numeric display will not work properly after the application is converted to FactoryTalk View Machine Edition.
Numeric Input Cursor Point, Numeric Data Display	Fixed Position and PLC Controlled decimal display options	Use an expression to achieve the same result. Assign the expression to the object's **Value** connection. For information about expressions, see Use expressions on page 475.
Numeric Input Cursor Point, Numeric Keypad Enable Button, Numeric Keypad	**PLC Controlled** and **Decimal Key Controlled** input options	Objects are converted with the **Decimal Point** property set to **Implicit**.
Numeric Input Cursor Point	Retain Cursor on Cancel	The numeric input cursor point retains focus when the operator cancels entering a numeric value.
Maintained push Button, Multistate Push Button, Control List Selector	Initial state values	If you want to set these objects' states on application startup, create a macro to set the appropriate tag values for the objects' connections. For information about macros, see Use macros on page 561. Assign the macro in the **Startup** editor. For details, see Help.

Graphic object	Unsupported feature in FactoryTalk View	Notes
Trend	Blinking pens Date labels on the X-Axis Background screen plotting	The date is shown in the title. You can plot tag values in the background by assigning the tags to a data log model. Tags set up for background screen plotting are automatically assigned to a data log model on conversion. However, data log models do not plot expression values. Therefore, expressions set up for background screen plotting are not converted. For information about data logging, see Set up data logging on page 519.
All objects	PanelBuilder 1400e object name	Object names are replaced with the FactoryTalk View default object names. The PanelBuilder 1400e object name is used for the object's description. You can view and edit the name and description in the **Property Panel**. For details, see Help.
All objects	Caption and image placement	FactoryTalk View supports one, three, or nine positions for captions and images, depending on the type of object. On conversion, captions and images are positioned using the closest match. Therefore some captions might overlap images, some captions might be truncated, and some images might be clipped to fit the object.
All objects	Multiple image labels	FactoryTalk View supports one image label per object or state. If a PanelBuilder 1400e object is set up to use multiple image labels, only the top left image is converted.

Convert expressions

Some PanelBuilder 1400e expression syntax is not supported in FactoryTalk View. Expressions are converted without modification, and then turned off by placing warning text at the beginning of the first line of the expression. In addition, exclamation marks (!) are placed at the beginning of each subsequent line of the expression. Warming text is also placed in expressions assigned to alarm triggers in the **Alarm Setup** editor. To turn on the expression, you must remove the warning text and exclamation marks, and revise the syntax if necessary.

The maximum expression length in FactoryTalk View is 16,000 characters. If a PanelBuilder 1400e expression contains more than 16,000 characters, the excess characters are not converted.

Some PanelBuilder 1400e objects support both tags and expressions. For these objects, if the text assigned to a connection could be valid syntax for both a tag and an expression, the connection is treated as an expression, and is therefore turned off.

For example, N20-0_String_64 could be the name of a tag, or it could be an expression that subtracts "0_String_64" from the tag "N20." The text would be converted as an expression, and turned off.

To turn on an expression

1. Select the object containing the expression.
2. Open the **Property Panel**, and then click the **Connections** tab.
3. In the **Exprn** column, click the **Browse** button beside the expression to turn on.
4. In the **Expression** editor, delete the warning text and exclamation marks.
5. Revise the expression, if necessary, using the tables in the following three sections as guides.
6. Click **Check Syntax**.

For more information about using the Expression editor, see Use expressions on page 475 or Help.

Equivalent expression syntax

This table describes FactoryTalk View expression syntax that is equivalent to PanelBuilder 1400e syntax. When you edit the converted expressions, replace the PanelBuilder 1400e syntax with the FactoryTalk View equivalent.

Syntax that is not listed in this table or in the next section is okay the way it is.

Type of expression component or operator	PanelBuilder 1400e syntax	FactoryTalk View syntax
Comment	REM or ‘	!
Line continuation	_ (underscore)	Not needed.
Equality	(=)	EQ or ==
Bitwise Not	Not	~ (tilde)
Bitwise And	And	&
Bitwise Or	Or	| (pipe)
Bitwise XOr	XOr	^
If both operands are Byte, Integer, Long, Variant, or any combination of these data types, use the FactoryTalk View syntax. For other data types, no change is needed.		

Unsupported expression syntax

This table describes the PanelBuilder 1400e expression syntax that is not supported in FactoryTalk View with information about how to achieve the same result where possible.

Type of expression component or operator	PanelBuilder 1400e syntax	Equivalent FactoryTalk View syntax (if any)
Exit statement	Exit	
Local variables	DIM *varname* AS ... *varname* =	
Integer division	\	(*x* - (*x* MOD *y*))/*y*
Endif	If then endif If then else endif	If then else 0 If then else
Select case	Select Case Case1...CaseN CaseElse EndSelect	Use nested if-then-else.
Logical Xor (if one or both operands are Boolean or Single data types)	Xor	NOT ((*x* AND *y*) OR NOT (*x* OR *y*))

Order of precedence

The order of precedence is slightly different in FactoryTalk View. Check your expressions to make sure the result is what you intend.

PanelBuilder 1400e order of precedence	FactoryTalk View order of precedence
( )	( )
- (negation)	NOT, ~ (tilde)
*, / (floating point division)	*, /, MOD, %, **, AND, &&, &, >>, <<
\ (integer division)	+, -, OR, ||, |, ^
MOD	EQ, ==, NE, <>, LT, <, GT, >, LE, <=, GE, >=
+, - (subtraction)	
=, <>, <, >, <=, >=	
Not	
And	
Or	
Xor	

For more information about order of precedence, see Evaluation order of operators on page 484.

Convert PanelBuilder and PanelBuilder32 applications

This appendix describes:

- Terms that are different in PanelBuilder and FactoryTalk View
- Steps for converting PanelBuilder applications
- Names of equivalent graphic objects in PanelBuilder and FactoryTalk View
- PanelBuilder graphic objects that are not supported in FactoryTalk View
- PanelBuilder settings and controls that are not supported in FactoryTalk View
- How communications are converted and which PanelBuilder communication protocols are not supported in FactoryTalk View
- Convert PanelBuilder Remote I/O communications
- PanelBuilder graphic object features that are not supported in FactoryTalk View, with information about how to achieve the same result when possible

This appendix uses the term PanelBuilder to refer to both PanelBuilder and PanelBuilder32 features.

For information about converting applications from PanelBuilder 1400e, see Convert PanelBuilder 1400e applications on page 565.

Terminology

These terms are different in PanelBuilder and FactoryTalk View.

PanelBuilder term	FactoryTalk View term
screen	display, graphic display
programmable controller	data source
control	connection

In FactoryTalk View, the data source can be memory or a device such as a programmable controller or an OPC server. FactoryTalk View writes values to and reads values from the data source. The data source is configured to exchange information (in the form of numeric or string values) between FactoryTalk View and the machine that your application is controlling. The

general term data source is used unless specifically discussing a programmable controller.

Steps for converting PanelBuilder applications

Follow these steps to convert PanelBuilder applications:

1. Convert the application file, as described in the next section.
2. Specify additional project settings, as described on About project settings on page 72. For example, if you want the application to have a border around its graphic displays, or to use a title bar, you can specify these options in the **Project Settings** editor.
3. If you select **Convert to new window size**, check the position of the graphic objects in each display.
4. Set up communications and edit tags that don't convert directly.

   For more information, see Convert non-RIO communications on page 587.
5. Set up graphic object features that don't convert directly.

   For more information, see Unsupported graphic object features on page 590.

Convert PanelBuilder application files

Follow these steps to convert a PanelBuilder application file, with the extension .pba or .pva, to an FactoryTalk View application file, with the extension .med. The original PanelBuilder application file is not modified by the conversion.

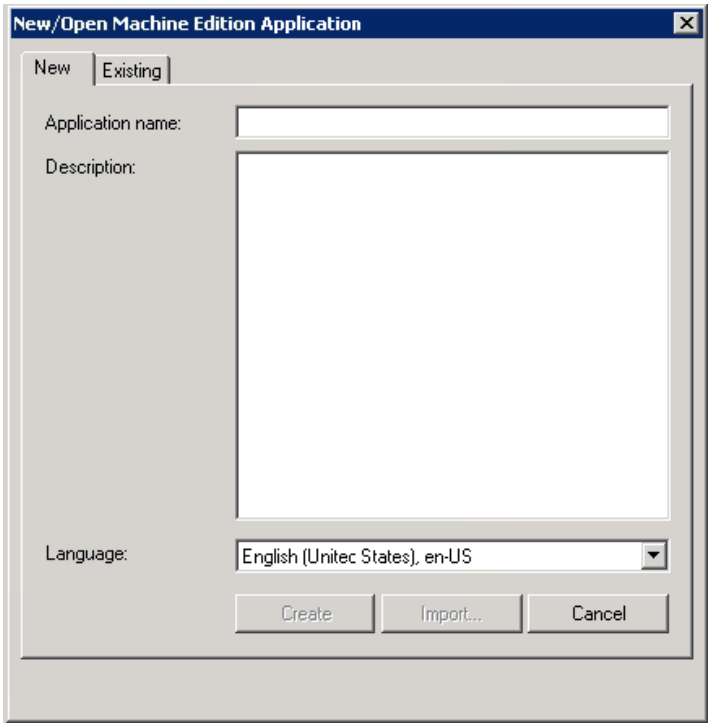
Steps to take in PanelBuilder before you convert the application

1. Semicolons (;) in tag addresses are supported in PanelBuilder, but not in FactoryTalk View Studio. Before importing the PanelBuilder application, in the PanelBuilder Tag Editor, change the semicolons to colons (:).
2. Dashes (-) in tag names are supported in PanelBuilder, but not in FactoryTalk View Studio. Before importing the PanelBuilder application, in the PanelBuilder Tag Editor, locate any tags whose names contain dashes and duplicate the tags. Then rename the tags without the dash, or replace the dash with an underscore (_). Once the tags have been renamed, use the Tag Search feature to find the graphic objects using the original tag names and edit the objects to replace the old tag names with the new ones.

You can convert the PanelBuilder application when you open FactoryTalk View Studio, or once FactoryTalk View Studio is already open.

To convert a PanelBuilder application when you open FactoryTalk View Studio

1. Open FactoryTalk View Studio.



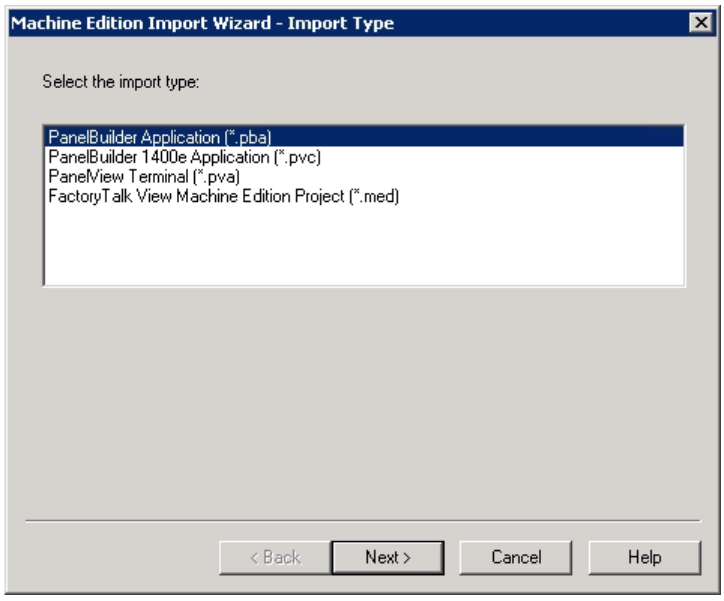
2. In the **New** tab, in the Application name box, type a name for your converted application, up to 32 characters long.

3. If desired, type a description of the application.

   If the PanelBuilder application contains an Application Description, the Application Description will overwrite the description you type here. You can add or change the description later, as described in View application properties on page 77.

   Specify the last language that was used to edit the application. This will be used for the converted application.You can only import one language for your application, even if the original application uses multiple languages. The imported language will be the last language used to edit the application. For information about using different languages, see Set up language switching on page 197.

4. Click **Import**.



5. Follow the steps in the Machine Edition Import Wizard.

   For details about the options in the Machine Edition Import Wizard, see Help.

When you complete the steps of the wizard, FactoryTalk View Studio converts the PanelBuilder application, creates the converted application's folders and files, and then shows the converted application in the Explorer window in FactoryTalk View Studio.

If there are any messages about conversion, they are shown automatically in the **Project Status** dialog box.

The converted application is created in the **ME\HMI projects** directory, in a folder with the same name as the application name you specified in step 2.

This is the path to the ME\HMI projects directory:

- (Windows XP) **C:\Documents and Settings\All Users\Shared Documents\RSView Enterprise\ME\HMI projects**
- (Windows Server 2012, Windows 8.1, Windows 8, Windows 7, and Windows Server 2008) **C:\Users\Public\Public Documents\RSView Enterprise\ME\HMI projects**

Conversion messages are saved in a file called Convert.log, in the HMI projects directory.

To convert a PanelBuilder application when FactoryTalk View Studio is already open

1. From the **File** menu, select **New Application**, or click the New Application tool .

   If an application is already open, FactoryTalk View Studio asks you whether to close the application that is currently open. Click **Yes**.

2. Follow steps 2 through 7 in the previous procedure.

Equivalent graphic objects

This section describes graphic objects that are equivalent in PanelBuilder and FactoryTalk View, but have different names in the two products.

This PanelBuilder object	Is converted to this FactoryTalk View object	Notes
Numeric Entry Keypad Enable Button	Numeric input enable button	
Numeric Entry Cursor Point	Numeric input enable button	
Increment/Decrement Entry Button	Numeric input enable button	The Numeric Input Enable button is set up to work as a Ramp button, using the Fine Step value. The Coarse Step value is not converted.
ASCII Entry Keypad Enable button	String Input Enable button	The Show Current String on ASCII Scratchpad setting is not converted. The pop-up scratchpad or keyboard is always blank when opened.
ASCII Entry Cursor Point	String Input Enable button	The Show Current String on ASCII Scratchpad setting is not converted. The pop-up scratchpad or keyboard is always blank when opened.
Message Display	Multistate indicator	
Numeric Data Display	Text	The text object contains a numeric embedded variable that shows the read tag. If the original numeric data display object does not contain text, manually create a numeric display object with the desired properties in FactoryTalk View.
Connected Line	Polyline	
Circle	Ellipse	The ellipse has a circular shape.

This PanelBuilder object	Is converted to this FactoryTalk View object	Notes
Freeform	Freehand	
Screen List Selector	Display list selector	
Goto Screen Button	Goto display button	
Return Screen Button	Return to display button	
New Password Button	Password button	
Print Alarm List Button	Print alarm history button	
Clear Alarm List Button	Clear alarm history button	

Unsupported graphic objects

These PanelBuilder objects are not supported in FactoryTalk View:

- Print Only Object
- Circular Scale
- Scrolling Text
- Print Alarm Button
- Horn Silence Button
- Lamp/Horn Test Button
- Select Operator Button
- Enable/Disable Security Button
- Verify Password Button. The FactoryTalk View Password button opens a dialog box that allows the user to type and verify a new password.

Unsupported settings and controls

This section describes PanelBuilder settings and controls that are not used in FactoryTalk View.

Settings and controls for alarms

FactoryTalk View does not use these PanelBuilder features and settings to manage alarms:

- **Ack setting for alarm messages -** in FactoryTalk View, all alarms can be acknowledged
- **Bit alarm acknowledgement**

FactoryTalk View does not use these PanelBuilder controls to manage alarms:

- **Remote Ack All Handshake Tag**
- **Remote Clear All Alarm Tag**

- **Remote Clear All Alarm Handshake Tag**

Invalid characters in screen names and tag names

Characters in PanelBuilder screen names and tag names that are not supported in FactoryTalk View are replaced with the underscore character.

Time and date

PanelBuilder time and date formats are not converted. For details about FactoryTalk View time and date formats, see Time, date, and number formats for graphic objects on page 403.

External fonts

PanelBuilder external fonts are not converted. When you convert your application you can specify the font to use instead. For details, see Help for the Machine Edition Import Wizard.

Screen security settings

PanelBuilder screen security settings are not converted, because FactoryTalk View uses a different method to assign security to graphic displays. For information about setting up security in FactoryTalk View, see Set up security on page 175.

Power-up options

These PanelBuilder power-up options are not imported into FactoryTalk View:

- Write Last Terminal State to Controller
- Display Last User Screen
- Use Terminal Presets

Convert non-RIO communications

This section describes how communications that do not use Remote I/O (RIO) are converted.

FactoryTalk View does not use nodes for communications. Nodes are converted to RSLinx topics. Topics are then converted into device shortcuts, to run with RSLinx Enterprise. You must have both RSLinx Classic and RSLinx Enterprise installed to make this two-step conversion.

Tags are converted to HMI device tags and RSLinx aliases. The Unsolicited_Msgs node is not converted.

If you import an application multiple times, delete the device shortcuts in RSLinx Enterprise before re-importing. Otherwise, multiple unused device shortcuts will be created in RSLinx Enterprise.

For more information about setting up communications, see Set up communications on page 79.

For information about converting RIO communications, see Convert RIO communications on page 574.

Tags for unsupported communication protocols

Some communication protocols are not supported in FactoryTalk View. For example, DH+ communications that use the AutoMax node type are not supported. FactoryTalk View does not support CIP and Assembly Object addressing (used in PanelBuilder32 Ethernet communications).

Tags that use unsupported communication protocols are converted to HMI memory tags. Once you have set up communications for your converted application, change the memory tags to device tags that point to the correct addresses. All other imported tags are converted to HMI device tags.

For information about editing HMI tags, see Use HMI tags on page 97. For more information about which communication protocols are not supported, see Help or see the Rockwell Automation Knowledgebase.

Bit array tags

You can monitor bit arrays for alarm conditions in FactoryTalk View, but you can't assign bit arrays to most graphic objects or write to bit arrays. (The only exception is the piloted control list selector object. For this object, you can assign a bit array tag to the **Visible States** connection.)

All bit array tags in your PanelBuilder application are converted to HMI memory tags.

For information about monitoring bit arrays for alarm conditions, see Set up alarms on page 119. For information about editing HMI tags, see Use HMI tags on page 97. For information about the piloted control list selector, see Help.

Convert RIO communications

Remote I/O (RIO) communications are not supported for applications that will run on personal computers. You can use RIO communications on the PanelView Plus and PanelView Plus CE runtime platforms.

Supported PanelBuilder tags are converted to HMI device tags and RSLinx aliases. For information about unsupported PanelBuilder tags, see below.

To convert an RIO application from PanelBuilder to FactoryTalk View

1. Convert the application, as described on Convert PanelBuilder application files on page 582.

2. Open the RSLinx Enterprise data server, and then double-click **Communication Setup**.

3. In the **Communication Setup** editor, add an RIO driver.

   - For PanelView Plus 400 and 600 terminals, use the 2711P-RN1 driver.
   - For all other PanelView Plus or PanelView Plus CE terminals, use the 2711P-RN6 driver.

   For information about adding drivers in RSLinx, see RSLinx Help.

4. Expand the RIO tree, right-click RIO Data, and then click **Configure RIO**.

5. In the **RIO Configuration** dialog box, right-click RIO, and then click **Import**.

6. Browse to the location of the RIO configuration file.

   The file is saved in the root of the application's directory.

7. In the **Communications** Setup editor, create a device shortcut that points to the RIO data device.

   For information about creating a device shortcut, see RSLinx Help.

8. Apply the shortcut to the RIO driver.

9. Correct any invalid RIO configurations. Invalid RIO configurations are highlighted with red "x" icons.

   Note: If red "x" icons appear after you import the RIO .xml file, you can fix block tags in the Communication Setup editor in FactoryTalk View. The length of block tags must be the same for Read and Write pairs sharing the same rack, group, and slot.

10. Save the converted RIO application.

Unsupported PanelBuilder RIO tags

A PanelBuilder RIO tag will be converted to an HMI memory tag and an error will be logged to the conversion log file if the RIO tag:

- Has a blank address.
- Has a data type of Bit Array and its address does not have an array size of 1, 8, 16, or 32.
- Has a data type of Bit Array, and its array size is 16 or 32, but its address does not have a bit offset of 0.
- Has a data type of Bit or BOOL, and its address does not contain the bit delimiter character "/".
- Has a data type of 4-BCD, Unsigned Integer, Signed Integer or INT, Character Array, or DINT, and its address contains the bit delimiter character "/".
- Is a block transfer tag with a data type of Bit Array, and its array size is 8, but its address does not have a bit offset of 0 or 8.
- Is a block transfer tag with a data type of SINT, and its address does not have a bit offset of 0 or 8.
- Is an I/O tag with an address that references an undefined rack.
- Is an I/O tag with a data type of SINT, and its address does not have a bit offset of 0 or 10.
- Does not have a valid I/O address or block transfer address.

Unsupported graphic object features

This section describes features of PanelBuilder graphic objects that are not supported in FactoryTalk View. The Notes column provides additional information and describes methods for achieving the same result when possible.

Graphic object	Unsupported feature in FactoryTalk View	Notes
Image text, arc, ellipse, freehand, line, polyline, rectangle, wedge	Blink property	In FactoryTalk View, all of the listed objects except images use color animation to blink. For details, see Set up color animation on page 465. Color images do not blink. Monochrome images use the Blink property to blink.
Increment/Decrement Entry Button (Converted to Numeric Input Enable button)	Allow Home/End Allow Wrap Ramp by coarse steps	

Graphic object	Unsupported feature in FactoryTalk View	Notes
Maintained push Button, Multistate Push Button, Standard Control List Selector	Initial state values	If you want to set these objects' states on application startup, create a macro to set the appropriate tag values for the objects' connections. For information about macros, see Use macros on page 561. Assign the macro in the Startup editor. For details, see Help.
Multistate Indicator, Message Display	Print Setting	
Bar Graph	Inner text and inner graphic	Converted to a separate text object and image object.
Gauge	Inner text and inner graphic	Converted to a separate text object and image object.
	Scale clipping	If the scale does not fit within the height or width of the gauge, it is not clipped. Check the position of the scale to ensure it does not overlap other objects.
	Needle	Converted to a separate gauge object; if the gauge had 2 needles, each needle is converted to a separate gauge object.
Alarm List	No Acknowledgement Required	All alarms can be acknowledged.
All objects	Image placement	FactoryTalk View supports one, three or nine positions for images, depending on the type of object. On conversion, images are positioned using the closest match. Therefore some images might be clipped to fit the object.
All objects	Turn Object View On property	If this property is set to False, the converted object has a transparent background, no border, no caption, and no image.
All objects	Blinking inner graphics	If the inner graphic uses a color image, it will not blink. Use a monochrome image if you want the inner graphic to blink.

System tags

This appendix describes system tags.

System tags are pre-configured HMI tags created by FactoryTalk View. System tags are read-only. Show them as needed in your application.

Alarms

The following tag contains the time and date when the status of alarms was last reset. The date uses the long date format.

Tag name	Type	Function
system\AlarmReset DateAndTimeString	String	Contains the date and time of the last alarm reset.

For information about resetting alarms, see Methods for resetting alarms on page 127.

Graphics

The following HMI tags can be used to make graphic objects appear as though they are blinking on and off:

Tag name	Type	Function
system\BlinkFast	Digital	Toggles on and off every 100 ms (10 times per second).
system\BlinkSlow	Digital	Toggles on and off every 500 ms (twice per second).

A more efficient way to make graphic objects blink is to use the blinking color option in color animation. For details, see Set up color animation on page 465.

Also, many objects have a Blink property that you can set up. For information about specific objects, see Help.

Time

These HMI tags record time and date information in various formats:

Tag Name	Type	Provides this data	Read or write
system\Date	String	System date.	Read only
system\DateAndTime Integer	Analog	Number of seconds elapsed since midnight (00:00:00) January 1, 1970, coordinated universal time.	Read only

Tag Name	Type	Provides this data	Read or write
system\DateAndTime String	String	Complete date and time display. For example: Monday, December 12 2001 10:47:50 AM	Read only
system\DayOfMonth	Analog	Day of the month (1 - 31).	Read only
system\DayOfWeek	Analog	Day of the week (1-7); Sunday = 1.	Read only
system\DayOfYear	Analog	Day of the year (1-366).	Read only
system\Hour	Analog	Hour of the day (0-23).	Read and write
system\Minute	Analog	Minutes (0 - 59).	Read and write
system\Month	Analog	Number for month (1-12).	Read only
system\MonthString	String	Name of the month.	Read only
system\Second	Analog	Seconds (0 - 59).	Read and write
system\Time	String	System Time.	Read only
system\Year	Analog	The year (1980-2099).	Read only

For information about using the data source to update the system date and time, or about sending the runtime computer's date and time to the data source, see Set up global connections on page 111.

User

This tag contains the name of the current user:

Tag Name	Type	Function
system\User	String	Contains name of logged-in user.

We recommend that you use the expression security function CurrentUserName( ) instead of the system\User tag, especially if you intend to convert the application to FactoryTalk View Supervisory Edition. In distributed applications, system\User returns the name of the user logged into the HMI server, not the user logged into the display client.

For more information about the security functions, see Security functions on page 486.

ODBC database schema

This appendix describes the ODBC database format, or schema, for messages from FactoryTalk Diagnostics. The target table of the ODBC database to which you are sending messages must use the format shown in this appendix.

The option of logging FactoryTalk Diagnostics messages to an ODBC database is available for personal computers only.

For information about setting up FactoryTalk Diagnostics, see Set up FactoryTalk Diagnostics on page 161.

FactoryTalk Diagnostics log table

FactoryTalk Diagnostics log data in ODBC format uses one table.

This column	Contains	SQL data type	Length
TimeStmp	The time and date data was logged, in coordinated universal time format. Encoded as a date variant.	SQL_TIMESTAMP	Driver dependent
MessageText	Message to be logged.	SQL_VARCHAR, *or* SQL_CHAR	254
Audience	A number representing the message audience: • 0 for Operator • 1 for Engineer • 2 for Developer • 3 for Secure	SQL_SMALLINT, *or* SQL_INTEGER	1
Severity	A number representing the severity of the diagnostics message: • 0 for Error • 1 for Warning • 2 for Information • 3 for Audit	SQL_SMALLINT, *or* SQL_INTEGER	1
Area	The FactoryTalk path to the area in which the activity occurred. Used for FactoryTalk View Site Edition only.	SQL_VARCHAR, *or* SQL_CHAR	80
Location	The name of the computer where the message was generated.	SQL_VARCHAR, *or* SQL_CHAR	15

This column	Contains	SQL data type	Length
UserID	The name of the user (including domain name, if there is one) that initiated the action that caused the diagnostics message. If the diagnostics message was caused by an HMI server, the user column contains "System."	SQL_VARCHAR, *or* SQL_CHAR	38
UserFullName	The full name of the user that was logged in when the activity occurred.	SQL_VARCHAR, *or* SQL_CHAR	255
Provider	The name of the product that generated the message.	SQL_VARCHAR, *or* SQL_CHAR	20

Import and export alarm XML files

This appendix describes:

- Create alarm XML files
- Export, editing, and importing XML files
- The alarm XML file structure

About XML

XML is the Extensible Markup Language used to create documents with structured text information. It has a standardized format and structure. You can use XML to edit the elements and attributes needed to create an alarm setup file or to modify graphic displays. For information about working with graphics XML files, see Import and export graphics XML files on page 613.

Sometimes editing your alarm setup in an XML file is quicker than working in FactoryTalk View. For example, if you have a list of 100 tags to monitor for alarms, with multiple messages for each tag, you might prefer to enter all the information in a text editor, and then import the alarm setup information into FactoryTalk View.

Another example of using XML files is to export the alarm setup information you develop in one application, import the setup information to another FactoryTalk View application, and then modify the alarm setup as needed. Or, you could modify the information in the XML file before importing it.

For more information about XML, see the World Wide Web Consortium's web page about XML at **http://www.w3.org/XML**.

Create alarm XML files by exporting

The quickest way to create an XML file for your application's alarm setup is to export the data from FactoryTalk View. You can then open the XML file in Notepad, make your changes, and import the file back into FactoryTalk View.

Note: The strings for the application's current language are exported to the XML file. To export strings for another language, reopen the application in the new language and repeat the XML export.

To export alarm information to an XML file

1. In the Explorer window, right-click the **Alarm Setup** editor.
2. Click **Import and Export**.

   The Alarm Import Export Wizard opens.
3. Follow the instructions in the wizard.

   For information about using the Alarm Import Export Wizard, see Help.

FactoryTalk View creates a file with the name you specify, in the location you specify.

Edit XML files

We recommend that you use Notepad to edit your XML files.

If you do not want to change a property, you don't need to include it in the XML file.

Save XML files in Notepad

Save XML files created or edited in Notepad using either UTF-8 or UTF-16 file format. Notepad's Unicode file type corresponds to UTF-16 file format. For files containing strings in English or other Latin-based languages, UTF-8 is recommended, to reduce the size of the XML file. For other languages such as Chinese, Japanese, or Korean, UTF-16 is recommended.

The first line of every XML file contains XML version and encoding attributes. Make sure the encoding attribute matches the format that you are going to use when you save the file. For example, if the original file was saved in UTF-8 format and you plan to save it in UTF-16 format, make sure the first line specifies encoding="UTF-16".

Test XML files

An XML file must be well-formed to be imported. To find out whether your XML file is well-formed, test it.

To test an XML file

- Open the XML file in Internet Explorer.

If you can see the XML code, your file is well-formed. If the XML code is not well-formed, Internet Explorer shows an error message.

Import XML files

You can import an alarm setup that has been created using an external programming tool or editor, or you can import an XML file that you originally exported from FactoryTalk View and then modified.

When you import an alarm setup, your existing alarm setup will be overwritten. Back up your application first, using the Application Manager tool. Or, you can save a copy of your existing alarm setup by exporting it to an XML file before you import the new one.

If the application is a PanelView Plus 7 Standard application, or a Compact Machine Edition application (application running on PanelView Plus 6 Compact, or PanelView Plus Compact terminals), only the number of alarms allowed by the Compact application limits will be imported.

Error log file

If errors occur during importing, the errors are logged to a text file. The file opens automatically when importing is finished. The last paragraph of the file lists the location of the file.

To import alarm information from an XML file

1. In the Explorer window, right-click the **Alarm Setup** editor.
2. Click **Import and Export**.

   The Alarm Import Export Wizard opens.
3. Follow the instructions in the wizard.

   For more information about using the Alarm Import Export Wizard, see Help.

Alarm setup XML file structure

The alarm setup XML file is a FactoryTalk View XML document that describes the alarm setup for an application. The root element of the XML document is called **alarms**. It represents the **Alarm Setup** editor. An XML document can contain only one root element. All other elements in the document must be contained or nested within the root element.

In an XML document, the start of an element is marked <**element name**>. The end is marked <**/element name**>.

If the element contains no subelements, the end can be marked />. For example, <trigger id="T1" type="value" ack-all-value="0" />.

The syntax for specifying an attribute for an element is **attribute="value"**. The attribute value must be enclosed in single or double quotes.

Here is a sample structure for an alarm XML document:

Element	Description
<alarms>	Root element.
<alarm>	Contains attributes from the **Advanced** tab of the **Alarm Setup** editor, as well as the triggers and messages elements.
<triggers>	Contains a trigger element for each trigger in the Triggers tab of the **Alarm Setup** editor.
<trigger id="T1" />	Contains attributes for the first alarm trigger.
<trigger id="T2" />	Contains attributes for the second alarm trigger.
</triggers>	Indicates the end of the triggers element.
<messages>	Contains a message element for each message in the Messages tab of the **Alarm Setup** editor.
<message id="M1" />	Contains attributes for the first alarm message.
<message id="M2" />	Contains attributes for the second alarm message.
</messages>	Indicates the end of the messages element.
</alarm>	Indicates the end of the alarm element.
</alarms>	Indicates the end of the alarms element.

You can specify multiple attributes for an element. For example, the alarm element contains 12 possible attributes from the **Advanced** tab of the **Alarm Setup** editor.

For more information about alarm elements and their attributes, see Help for the Alarm Import Export Wizard.

RFC1766 names

This appendix describes RFC1766 names for Windows languages.

Mapping languages to RFC1766 names

The following table lists the languages that Windows supports and the RFC1766 name associated with each language. You can use the codes to name the translated application files before importing them. The codes are also used with the CurrentLanguage function.

RFC1766 Name	Language – Country/Region
af–ZA	Afrikaans – South Africa
sq–AL	Albanian – Albania
ar–DZ	Arabic – Algeria
ar–BH	Arabic – Bahrain
ar–EG	Arabic – Egypt
ar–IQ	Arabic – Iraq
ar–JO	Arabic – Jordan
ar–KW	Arabic – Kuwait
ar–LB	Arabic – Lebanon
ar–LY	Arabic – Lybia
ar–MA	Arabic – Morocco
ar–OM	Arabic – Oman
ar–QA	Arabic – Qatar
ar–SA	Arabic – Saudi Arabia
ar–SY	Arabic – Syria
ar–TN	Arabic – Tunisia
ar–AE	Arabic – United Arab Emirates
ar–YE	Arabic – Yemen
hy–AM	Armenian – Armenia
az–AZ–Cyrl	Azeri (Cyrillic) – Azerbaijan
az–AZ–Latn	Azeri (Latin) – Azerbaijan
eu–ES	Basque – Basque
be–BY	Belarusian – Belarus
bg–BG	Bulgarian – Bulgaria
ca–ES	Catalan – Catalan
zh–HK	Chinese – Hong Kong SAR (Default Sort Order – Stroke Count)
zh–HK	Chinese – Hong Kong SAR (Alternate Sort Order – Stroke Count)

RFC1766 Name	Language – Country/Region
zh–MO	Chinese – Macau SAR (Default Sort Order – Pronunciation)
zh–MO	Chinese – Macau SAR (Alternate Sort Order – Stroke Count)
zh–CN	Chinese – China (Default Sort Order – Pronunciation)
zh–CN	Chinese – China (Alternate Sort Order – Stroke Count)
zh–SG	Chinese – Singapore (Default Sort Order – Pronunciation)
zh–SG	Chinese – Singapore (Alternate Sort Order – Stroke Count)
zh–TW	Chinese – Taiwan (Default Sort Order – Stroke Count)
zh–TW	Chinese – Taiwan (Alternate Sort Order – Bopomofo)
hr–HR	Croatian – Croatia
cs–CZ	Czech – Czech Republic
da–DK	Danish – Denmark
div–MV	Dhivehi – Maldives
nl–BE	Dutch – Belgium
nl–NL	Dutch – The Netherlands
en–AU	English – Australia
en–BZ	English – Belize
en–CA	English – Canada
en–CB	English – Caribbean
en–IE	English – Ireland
en–JM	English – Jamaica
en–NZ	English – New Zealand
en–PH	English – Philippines
en–ZA	English – South Africa
en–TT	English – Trinidad and Tobago
en–GB	English – United Kingdom
en–US	English – United States
en–ZW	English – Zimbabwe
et–EE	Estonian – Estonia
fo–FO	Faroese – Faroe Islands
fa–IR	Farsi – Iran
fi–FI	Finnish – Finland
fr–BE	French – Belgium
fr–CA	French – Canada
fr–FR	French – France
fr–LU	French – Luxembourg
fr–MC	French – Monaco
fr–CH	French – Switzerland
mk–MK	FYRO Macedonian
gl–ES	Galician – Galician
ka–GE	Georgian – Georgia (Default Sort Order – Traditional)
ka–GE	Georgian – Georgia (Alternate Sort Order – Modern Sort)

RFC1766 Name	Language – Country/Region
de–AT	German – Austria
de–DE	German – Germany (Default Sort Order – Dictionary)
de–DE	German – Germany (Alternate Sort Order – Phone Book Sort DIN)
de–LI	German – Liechtenstein
de–LU	German – Luxembourg
de–CH	German – Switzerland
el–GR	Greek – Greece
gu–IN	Gujarati – India
he–IL	Hebrew – Israel
hi–IN	Hindi – India
hu–HU	Hungarian – Hungary (Default Sort Order)
hu–HU	Hungarian – Hungary (Alternate Sort Order – Technical Sort)
is–IS	Icelandic – Iceland
id–ID	Indonesian – Indonesia
it–IT	Italian – Italy
it–CH	Italian – Switzerland
ja–JP	Japanese – Japan (Default Sort Order)
ja–JP	Japanese – Japan (Alternate Sort Order – Unicode)
kn–IN	Kannada – India
kk–KZ	Kazakh – Kazakhstan
kok–IN	Konkani – India
ko–KR	Korean – Korea (Default Sort Order)
ko–KR	Korean – Korea (Alternate Sort Order – Korean Xwansung Unicode)
ky–KZ	Kyrgyz – Kazakhstan
lv–LV	Latvian – Latvia
lt–LT	Lithuanian – Lithuania
ms–BN	Malay – Brunei
ms–MY	Malay – Malaysia
mr–IN	Marathi – India
mn–MN	Mongolian – Mongolia
nb–NO	Norwegian (Bokml) – Norway
nn–NO	Norwegian (Nynorsk) – Norway
pl–PL	Polish – Poland
pt–BR	Portuguese – Brazil
pt–PT	Portuguese – Portugal
pa–IN	Punjabi – India
ro–RO	Romanian – Romania
ru–RU	Russian – Russia
sa–IN	Sanskrit – India

RFC1766 Name	Language – Country/Region
sr–SP–Cyrl	Serbian (Cyrillic) – Serbia
sr–SP–Latn	Serbian (Latin) – Serbia
sk–SK	Slovak – Slovakia
sl–SI	Slovenian – Slovenia
es–AR	Spanish – Argentina
es–BO	Spanish – Bolivia
es–CL	Spanish – Chile
es–CO	Spanish – Colombia
es–CR	Spanish – Costa Rica
es–DO	Spanish – Dominican Republic
es–EC	Spanish – Ecuador
es–SV	Spanish – El Salvador
es–GT	Spanish – Guatemala
es–HN	Spanish – Honduras
es–MX	Spanish – Mexico
es–NI	Spanish – Nicaragua
es–PA	Spanish – Panama
es–PY	Spanish – Paraguay
es–PE	Spanish – Peru
es–PR	Spanish – Puerto Rico
es–ES	Spanish – Spain (Default Sort Order – International)
es–ES	Spanish – Spain (Alternate Sort Order – Traditional)
es–UY	Spanish – Uruguay
es–VE	Spanish – Venezuela
sw–KE	Swahili – Kenya
sv–FI	Swedish – Finland
sv–SE	Swedish – Sweden
syr–SY	Syriac – Syria
ta–IN	Tamil – India
tt–RU	Tatar – Russia
te–IN	Telugu – India
th–TH	Thai – Thailand
tr–TR	Turkish – Turkey
uk–UA	Ukrainian – Ukraine
ur–PK	Urdu – Pakistan
uz–UZ–Cyrl	Uzbek (Cyrillic) – Uzbekistan
uz–UZ–Latn	Uzbek (Latin) – Uzbekistan
vi–VN	Vietnamese – Vietnam

Features supported in different versions of FactoryTalk View

This appendix describes:

- Which versions of FactoryTalk View ME Station are supported.
- Which features are not supported in previous versions of FactoryTalk View ME Station.

Which versions are supported

FactoryTalk View Studio allows you to create runtime (.mer) files for multiple versions of FactoryTalk View ME Station. Options are:

- Runtime 8.10 Application (*.mer) (This is the default setting.)
- Runtime 8.0 Application (*.mer)
- Runtime 7.0 Application (*.mer)
- Runtime 6.10 Application (*.mer)
- Runtime 6.0 Application (*.mer)
- Runtime 5.10 Application (*.mer)
- Runtime 5.0 Application (*.mer)
- Runtime 4.0 Application (*.mer)
- Runtime 3.20 Application (*.mer)
- Runtime 3.10 Application (*.mer)

Multiple version support is useful for system designers and others who create and modify applications for different versions of FactoryTalk View ME Station on an ongoing basis. You can use the latest version of FactoryTalk View Studio on a single development computer to provide applications for terminals that use previous versions of FactoryTalk View ME Station.

To check which version of FactoryTalk View ME Station you are using:

1. In FactoryTalk View ME Station, click **Terminal Settings**.
2. Click **System Information**.

3. Click **About FactoryTalk View ME Station**.

Create runtime application files for previous versions

When you create the runtime application file (with the file extension .mer), you can specify the version of FactoryTalk View ME Station for which to create the file. For example, if the application will run on a terminal that uses RSView ME Station version 3.20, you can specify that version for the .mer file.

If the application contains features that are not supported by the version you select, FactoryTalk View shows a validation report that lists the unsupported features. The runtime application file is not created. You must remove or turn off the unsupported features before you can create the runtime application file.

For information about creating runtime application files, see Create runtime applications on page 221.

The remainder of this appendix lists the features that are not supported in previous versions of FactoryTalk View ME Station. The tables also show how to remove or replace the unsupported features.

Features that are not supported in version 7.00 or earlier

These version 8.0 features are not supported in version 7.00 of FactoryTalk View ME Station, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this
Add User/Group button	Delete the button object from **Graphic Displays**.
Delete User/Group button	Delete the button object from **Graphic Displays**.
Modify Group Membership button	Delete the button object from **Graphic Displays**.
Unlock User button	Delete the button object from **Graphic Displays**.
Enable User button	Delete the button object from **Graphic Displays**.
Disable User button	Delete the button object from **Graphic Displays**.
Login button	Clear the **Domain name** and **User name** fields in the **General** tab of **Login Button Properties** window.
Password button	Clear the **Change any user password (Administrative)** option in the **General** tab of **Password Button Properties** window.
Change User Properties button	Delete the button object from **Graphic Displays**.

Features that are not supported in version 6.10 or earlier

These version 7.0 features are not supported in version 6.10 of FactoryTalk View ME Station, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this
ME Alarm Embedded Server Update Rate	Select **Match Alarm Update Rate** or the same number as Maximum update rate in the **Advance** Tab of **Alarm Setup** editor.
MAXIMUM DATA POINTS enlargement support.	Change the Maximum data points value to be equal to or less than 300000 in the **Setup** tab of **Data Log Models** editor.
Parameterized Macro button	Clear **Use Variable Macro** check box in the **General** tab of Macro button property page.
Parameterized Goto display button	Clear **Use Variable Display** check box in the **General** tab of Goto display button property page.
Parameterized display position	Clear **Use Variable Display Position** check box in the **General** tab of Goto display button property page.
Graphic Objects configured with Gradient Shading background;	Change the Gradient Shading background style to Solid or Transparent. Delete Gradient animation from Graphics Objects animation. Or user can select other Fill Styles in color animation to create version 6.1 mer.
PNG image support	Delete PNG image object from **Graphic Displays**.

Features that are not supported in version 5.10 or earlier

These version 6.0 features are not supported in version 5.10 of FactoryTalk View ME Station, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this
Graphics objects with Shaded and Original animation is not support on v5.10 or earlier release.	Delete the Shaded or Original animation from Graphics objects animation. Or User can select **Solid** in **Fill Style** to create version5.1 mer

Features that are not supported in version 5.00 or earlier

These version 5.10 features are not supported in version 5.00 of FTView ME Station, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this
Tag or expression assigned to the **Close an On Top Display**, or **Close All On Top Displays** connections	Delete the tag or expression assigned in the **Display** tab of the **Global Connections** editor.
Tag or expression assigned to the **Parameter File**, or **Use Parameter List** connections	Delete the tag or expression assigned in the **Display** tab of the **Global Connections** editor.
Tag or expression assigned to one or more of the **Parameter Tag #1-10** connections	Delete the tag or expression in the **Display** tab of the **Global Connections** editor.
Parameter list property assigned in the **Properties** dialog box of a Display List Selector, Goto display button, or Logout button graphic object	In the object's **Properties** dialog box, clear the **Parameter list** assignment.
Parameter list property assigned to the display specified for auto logout in **Project Settings**	In the **Project Settings** editor's **Runtime** tab, clear the **Parameter list** assignment.
Parameter list assigned to the **Initial graphic** property in the Startup editor	In the **Startup** editor, clear the **Parameter list assignment** for the **Initial graphic**.
Use variable minimum/maximum property assigned to **Numeric Input Cursor Point** or Numeric Input Enable object	In the **Numeric** tab of the object's **Properties** dialog box, clear the **Use variable minimum/maximum** property.
Caption on Keypad property assigned to **Numeric Input Cursor Point** object	In the **Numeric** tab of the object's **Properties** dialog box, set the **Caption on keypad/scratchpad** property to blank.
Minimum or **Maximum** connections assigned for **Numeric Input Cursor Point** or **Numeric Input Enable object**	In the **Connections** tab of the object's **Properties** dialog box, delete the tag or expression assigned to the **Minimum** or **Maximum** connection.
Use variable ramp or **Use variable limit** property set for the **Ramp** button object	In the **General** tab of the object's **Properties** dialog box, clear the **Use variable lower/upper limit** and **Use variable ramp value** properties.
Ramp or **Limit** connection set for the **Ramp** button object	In the **Connections** tab of the object's **Properties** dialog box, delete the tag or expression assigned to the **Ramp** or **Limit** connection.
The application is designated as a Compact Machine Edition application in **Project Settings**	In the **General** tab of the **Project Settings** editor, clear the **Compact Machine Edition application** check box.

Features that are not supported in version 4.00 or earlier

These version 5.00 features are not supported in version 4.00 of RSView ME Station, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this
Delete action assigned to a **RecipePlus** button graphic object	Delete the button or change the action to Download, Upload, Upload and Create, Restore, or Save.
Rename action assigned to a **RecipePlus** button graphic object	Delete the button or change the action to Download, Upload, Upload and Create, Restore, or Save.
Display undefined strings using the default language option	In the **Language Configuration** dialog box, clear the option's check box.
Tag assigned to the **MERuntime RAM Usage**, **Total RAM Usage**, or **Available RAM** connection	Unassign the tag in the **Memory** tab of the **Global Connections** editor.
Tag or expression assigned to the **Remote RAM Usage** connection	Unassign the tag or expression in the **Memory** tab of the **Global Connections** editor.
CaptionOnBorder property assigned to graphic object	In the **Property Panel**, set the object's CaptionOnBorder property to False.
Embedded variable "L" character assigned to a caption or message	Select the **Tag** option in the **Numeric Variable or String Variable** dialog box for the caption or message.
Minus sign (-) qualifier used to show right-most text assigned to a caption or message	Clear the **Right-most characters in string are displayed** check box in the **String Variable** dialog box for the caption or message.
SHOWSTAR qualifier assigned to a caption or message	Clear the **Show* character if string is longer than field width** check box in the **String Variable** dialog box for the caption or message.
Embedded variable assigned to the title bar of an On Top display	Remove the embedded variable.
RSLinx Enterprise Remote I/O alias with a BitArray data type	Assign a different data type to the alias.
Global object parameter definition or value	Delete the global object parameter definition. The corresponding value will be deleted automatically. Use parameter files instead.

Features that are not supported in version 3.20 or earlier

The features listed in the previous table are not supported in version 3.20 of RSView ME Station. In addition, these version 4.00 features are not supported in version 3.20 of RSView ME Station, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this
Unsupported RSLinx Enterprise feature or shortcut warning	Delete or replace the feature or shortcut. A hardware patch might be available that allows you to use the feature. Therefore, the runtime application file will still be created.
Unsupported RSLinx Enterprise feature or shortcut error	Delete or replace the feature or shortcut.
Global reference object that is not linked to a global base object	Delete the global reference object, or link it to a global base object. All global reference objects that are linked to global base objects will be converted to standard graphic objects in the .mer file.
Language Switch button graphic object	Delete the button.
Password button graphic object	Delete the button.
RecipePlus button graphic object	Delete the button.
RecipePlus selector graphic object	Delete the selector.
RecipePlus table graphic object	Delete the table.
Acknowledge all alarms button with a filtered trigger	Clear the **Filtered triggers** box.
Print alarm history button with a filtered trigger	Clear the **Filtered triggers** box.
Print alarm status button with a filtered trigger	Clear the **Filtered triggers** box.
Clear alarm history button with a filtered trigger	Clear the **Filtered triggers** box.
Clear alarm history button with the Reset alarm status option cleared	Select **Reset alarm status**.

Features that are not supported in version 3.10 or earlier

The features listed in the previous tables are not supported in version 3.10 of RSView ME Station. In addition, these version 3.20 alarm options are not supported in version 3.10, nor in earlier versions. The right column describes how to remove or replace the feature.

To remove or replace this feature	Do this

Alarm list graphic object with an unsupported combination of alarm conditions	Do one of the following:
	• Select the **Display** check box for each alarm condition
	• Select the **Display** check box for only these alarm conditions:
	  • Active and unacknowledged
	  • Inactive and unacknowledged.

Alarm list graphic object with Blink selected for one or more alarm conditions	For all alarm conditions that you are showing, clear the **Blink** check box.
Alarm list graphic object with Use alarm colors turned off for one or more alarm conditions	For all alarm conditions that you are showing, select the Use alarm colors check box.
Alarm list graphic object with the Acknowledged symbol column turned off	Select the **Display column** check box for the **Acknowledged symbol** column.
Alarm list graphic object with an Acknowledged symbol other than *	Change the **Acknowledged symbol** to *.
Alarm list graphic object with the **Active symbol** column shown	Clear the **Display column** check box for the **Active symbol** column.
Alarm list graphic object with tags or expressions assigned to one or more connections	Clear the tags or expressions assigned to the connections.
Alarm list graphic object with Selected alarm indicator set to Cursor	Change the **Selected alarm indicator** to Highlight bar.
Alarm list graphic object with Lines per alarm set to >1	Change the **Lines per alarm** to 1.
Alarm banner graphic object with Use alarm colors selected	Clear the **Use alarm colors** check box.
Alarm status list graphic object with Use alarm colors selected	Clear the **Use alarm colors** check box.
Alarm status list graphic object with Lines per alarm set to >1	Change the **Lines per alarm** to 1.
Alarm status list graphic object with a Fore color other than white	Change the **Fore colo**r to white.

Import and export graphics XML files

This appendix describes:

- Create graphics XML files
- Export, edit, and import XML files
- The graphics XML file structure

About XML

XML is the Extensible Markup Language used to create documents with structured text information. It has a standardized format and structure. You can use XML to edit the elements and attributes needed to create an alarm setup file or to modify graphic displays and global displays. For information about working with alarm XML files, see Import and export alarm XML files on page 597.

Sometimes editing your display information in an XML file is quicker than working in FactoryTalk View. For example, if you have a list of 100 local messages to set up for a graphic display, you might prefer to enter all the information in a text editor, and then import the display information into FactoryTalk View.

For more information about XML, see the World Wide Web Consortium's web page about XML at:
http://www.w3.org/XML.

Create graphics XML files by exporting

The quickest way to create an XML file for your application's graphic displays is to export the data from FactoryTalk View. You can then open the XML file in Notepad, make your changes, and import the file back into FactoryTalk View.

Note: The strings for the application's current language are exported to the XML file. To export strings for another language, reopen the application in the new language and repeat the XML export.

To export graphic display information to an XML file

1. In the Explorer window, right-click the **Displays** editor, or the **Global Objects** editor.
2. Click **Import and Export**.

   The Graphics Import Export Wizard opens.
3. Follow the instructions in the wizard.

   For information about using the Graphics Import Export Wizard, see Help.

FactoryTalk View creates XML files for the selected graphic displays, in the location you specify.

FactoryTalk View also creates a file called BatchImport_*Application name*.xml, in the same location. You can use this file to import multiple displays at the same time. To import a different set of displays than you exported, edit the list of display names in the BatchImport_*Application name*.xml file.

Edit XML files

We recommend that you use Notepad to edit your XML files.

If you do not want to change a property, you don't need to include it in the XML file. When you import the file, if you select the option **Create new objects in the display**, properties that are not listed in the file are set to their default values. If you select the option **Update existing objects on the display**, only properties that are listed in the file are updated with imported information.

Note: If you include attributes for an object whose name does not match one of those in the graphic display, the attributes for that object are not imported. Attributes for all other objects in the file whose names do match the ones in the graphic display are imported.

Save XML files in Notepad

Save XML files created or edited in Notepad using either UTF-8 or UTF-16 file format. Notepad's Unicode file type corresponds to UTF-16 file format. For files containing strings in English or other Latin-based languages, UTF-8 is recommended, to reduce the size of the XML file. For other languages such as Chinese, Japanese, or Korean, UTF-16 is recommended.

The first line of every XML file contains XML version and encoding attributes. Make sure the encoding attribute matches the format that you are going to use when you save the file. For example, if the original file was saved in UTF-8 format and you plan to save it in UTF-16 format, make sure the first line specifies encoding="UTF-16".

Test XML files

An XML file must be well-formed to be imported. To find out whether your XML file is well-formed, test it.

To test an XML file

- Open the XML file in Internet Explorer.

If you can see the XML code, your file is well-formed. If the XML code is not well-formed, Internet Explorer shows an error message.

Import XML files

You can import a graphic display or global object display that has been created using an external programming tool or editor, or you can import an XML file that you originally exported from FactoryTalk View and then modified.

Note: When you import a graphic display or global object display, your existing display will be overwritten. Back up your application first, using the Application Manager tool. Or, you can save a copy of your existing display by exporting it to an XML file before you import the new one.

If the application is a PanelView Plus 7 Standard application, or a Compact Machine Edition application (application running on PanelView Plus 6 Compact, or PanelView Plus Compact terminals), only the number of displays allowed by the Compact application limits will be imported.

Error log file

If errors occur during importing, the errors are logged to a text file. The file opens automatically when importing is finished. The last paragraph of the file lists the location of the file.

Import graphics XML files

You can import a single graphic or global object display XML file at a time, or import multiple displays. You can also choose whether to import new objects or update existing objects.

To import multiple displays, specify the names of the displays in the file BatchImport_*Application name*.xml. FactoryTalk View creates this file when you export multiple displays. For details, see To export graphic display information to an XML file on page 614.

To import display information from an XML file

1. In the Explorer window, right-click the **Displays**, or **Global Objects** editor.
2. Click **Import and Expor**t.

   The Graphics Import Export Wizard opens.
3. Follow the instructions in the wizard.

   For more information about using the Graphics Import Export Wizard, see Help.

Graphics XML file structure

The graphic display or global object display XML file is a FactoryTalk View XML document that describes the objects and settings for a display. The root element of the XML document is called **gfx**. It represents the display. An XML document can contain only one root element. All other elements in the document must be contained or nested within the root element.

In an XML document, the start of an element is marked **<element name>**. The end is marked **</element name>**.

If the element contains no subelements, the end can be marked />. For example, <caption fontFamily="Arial" fontSize="8" bold="false" />.

The syntax for specifying an attribute for an element is **attribute="value"**. The attribute value must be enclosed in single or double quotes.

Here is a sample structure for a graphic display XML document containing two graphic objects. The second object has states:

Element	Description
<gfx>	Root element.

Element	Description
<displaySettings />	Contains attributes from the **Display Settings** dialog box in the **Graphics** editor.
<*object1*>	Contains attributes from the General and Common tabs in the object's **Properties** dialog box, as well as elements for the object's caption, image, animation, and connections.
<caption />	Contains attributes for the object's caption.
<imageSettings />	Contains attributes for the object's image.
<animations>	Contains an animation element for each type of animation set up for the object.
<animateVisibility />	Contains attributes for Visibility animation.
<animateColor />	Contains attributes for Color animation.
</animations>	Indicates the end of the animations element.
<connections>	Contains a connection element for each connection assigned to the object.
<connection name= "Value" />	Contains attributes for the **Value** connection.
<connection name= "Indicator" />	Contains attributes for the **Indicator** connection.
</connections>	Indicates the end of the connections element.
</*object1*>	Indicates the end of the *object1* element.
<*object2*>	Contains attributes from the General and Common tabs in the object's **Properties** dialog box, as well as elements for the object's states and connections.
<states>	Contains state elements for each of the object's states.
<state stateid="0">	Contains attributes for the object's first state, as well as elements for the state's caption and image.
<caption />	Contains attributes for the state's caption.
<imageSettings />	Contains attributes for the state's image.
</state>	Indicates the end of the state element.
<state stateid="1">	Contains attributes for the object's second state, as well as elements for the state's caption and image.
<caption />	Contains attributes for the state's caption.
<imageSettings />	Contains attributes for the state's image.
</state>	Indicates the end of the state element.
</states>	Indicates the end of the states element.
<connections>	Contains a connection element for each connection assigned to the object.
<connection name= "Value" />	Contains attributes for the **Value** connection.
<connection name= "Indicator" />	Contains attributes for the **Indicator** connection.

Element	Description
</connections>	Indicates the end of the connections element.
</*object2*>	Indicates the end of the *object2* element.
</gfx>	Indicates the end of the gfx element.

You can specify multiple attributes for an element. For example, the caption element contains 13 possible attributes.

Elements for group objects begin with **<group>** and end with **</group>**. The <group> element contains all the elements for each object in the group.

For more information about graphic object elements and their attributes, see Help for the Graphics Import Export Wizard.

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